



**The Montessori school as a ‘healing’ environment: translating childhood  
trauma research into effective, trauma-informed, educational practice.**

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## DECLARATION

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at a university or other institution of tertiary education.

Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

Signature  .....

Date.....09/September/2024.....

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## **DEDICATION**

I dedicate this work to my Lord and my God.  
Who poured out His soul unto death (Isaiah 53:12)  
so that we might have life.

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## ABSTRACT

**Background:** Childhood trauma/adversity is pervasive and has far-reaching consequences for children's health and well-being, leading to increased calls for trauma-informed practice (TIP). Archival data show that early Montessori schools (circa 1907-1917) were recognised as 'healing' schools, wherein trauma-affected children improved dramatically.

**Aims/objectives:** This project aimed to (1) investigate claims of psychological healing in early Montessori schools; (2) integrate the findings with contemporary knowledge on TIP; (3) develop a novel Continuing Professional Development (CPD) programme based on this integration; and (4) evaluate its perceived impact on staff in a test school.

**Method:** A multi-method, three-strand approach was used comprising three distinct and sequential studies. Study 1 involved a documentary analysis of eyewitness testimonies, media reports, and Montessori's own accounts of her early schools, to investigate how the Montessori approach supported trauma-affected children. Study 2 integrated the findings of Study 1 with contemporary trauma literature to develop an innovative CPD programme designed to enhance the capacities of early childhood teachers to support trauma-affected children. Study 3 then used a case study approach to provide a rich contextual account of teachers' (n=11) experiences of engaging with this programme, focusing on its perceived impact on their knowledge, attitudes/beliefs, professional practice, and their views on its feasibility.

**Findings:** Study 1 identified significant evidence of psychological healing in trauma-affected children attending Montessori's early schools. Study 2 found that several features of Montessori education cohere with contemporary research on TIP approaches, especially the Neurosequential Model in Education (NME), and that these can be integrated to develop a

programme of Montessori-attuned TIP. Study 3 found that early childhood/Montessori teachers rated the new programme highly, stating it positively impacted their practice.

**Conclusion:** This project makes a significant original contribution to existing knowledge on Montessori pedagogy and TIP and has important implications for supporting trauma-affected children in Ireland and elsewhere.

## PREFACE

*“Our schools,” says Montessori, “may be compared in the first place to sanatoria; for the first thing that happens in them is that the children are restored to mental health.”*

E. M. Standing, *Maria Montessori: Her Life and Work*. (1957), p. 178.

This research is rooted in my thirty years of practice as a Montessori teacher, (which concluded rather abruptly when COVID-19 struck). My work was mostly but not exclusively with children from two to six years. During those years, I shared much joy and laughter with the children who attended our schools and their parents, but I also grieved with some of them when, on enrolling, they told us of the adversities and traumas that had hit them, sometimes like a bolt out of the blue. Miscarriages, sudden infant deaths, acute or chronic illnesses, financial challenges, mental illness, domestic violence, separations, and divorces were sadly not rare occurrences for the families who enrolled with us over the decades. These adversities and the traumatic turmoil that followed, often had a profoundly negative impact on the children who joined our classes, frequently leaving them with emotional disturbances, as well as social and cognitive difficulties. Sometimes children came to us whose traumas we did not know because their loving parents or caregivers just could not talk about what had happened in their lives before we met them. Once, the mother of a young boy, who had never spoken a single word in the six months that he was with us, told us tearfully, on his last day with us, that it was he, who only months before joining our school, had found his baby sister blue and cold in her cot following a sudden infant death (SIDS) during the night. Another young mother told me, at a chance meeting a year after her little girl had suddenly dropped out of our school and neighborhood, that the child had witnessed several terrifying scenes of domestic violence, all perpetrated by the young, drug addicted father. This revelation, albeit belated, explained to me

why the little girl had become so withdrawn and silent for many weeks before she suddenly dropped out of school.

Yet, whether we knew or did not know the adversities and traumas our little people had been or were still being exposed to, we regularly witnessed psychological ‘healing’ in children. This psychological ‘healing’ fascinated me because it appeared to be associated with the children’s engagement in basic Montessori exercises and activities. For example, I noted that children who arrived in an agitated state seemed to become calm when they engaged in the Montessori exercises of practical life, e.g., sweeping a floor, scrubbing a table, washing a window, polishing a mirror, or folding and unfolding napkins, especially when they were allowed to repeat these activities as many times as they wished, without interruption or adult interference.

I was aware that Montessori had documented her observations of young children’s tendency to repeat exercises over and over (Montessori, 1936), and I was equally aware of Montessori’s observation that following repetition of an exercise, children not only appeared to be calm, but also became sociable and showed a desire to relate to others in a positive manner, showing a distinct absence of aggressive or rough behaviour. (Montessori, 1936, 1967/1949). I was also aware that Montessori had described how her Method helped to bring psychological healing to children left orphaned and homeless as a result of natural disasters, or war (Montessori, 1936). Now, however, I became intensely curious. I wanted to know if there were any reliable third-party accounts, (in addition to Montessori’s own accounts), of trauma-affected children experiencing psychological healing in Montessori’s early schools. This particular curiosity, to which I could find no contemporary published answers, led directly to this PhD project. In planning the PhD project, I knew that my starting point would have to be a study of the available archival and historical literature on Montessori’s early schools. I wanted to read eyewitness accounts if possible, describing the children who attended the schools. I

wanted to know what the children were like both before and after they were exposed to the Montessori approach. I wanted to know, if such accounts existed, what did they say about the materials, exercises, activities, and pedagogical approaches used, and what effect they had (if any) on the children's mental wellbeing. I also wanted to read media coverage, i.e., magazine and newspaper reports on the early Montessori schools. Most of all I wanted to know what, if any, evidence existed to justify Montessori's claims that her schools were "Case della salute" (Health Homes) (Montessori, 1966, p. 181), that were capable of promoting psychological healing in children. This curiosity led to the formulation of the first research question which became "What is the historical evidence supporting the claims that Montessori offered a 'healing' environment?" The answers to this research question led to the publication presented in chapter four.

I also needed to know if historical evidence from accounts of Montessori's early schools, which she claimed brought psychological healing to children, could be integrated with evidence from contemporary trauma theory to form a TIP/Montessori programme for contemporary early childhood/Montessori teachers. Specifically, I wanted to know if an integration of contemporary trauma theory with Montessori's original principles and practice would be capable of replicating her successes with trauma-affected children in contemporary Montessori schools, notwithstanding the social and cultural differences that now pertain. Once again, I found that there was a dearth of published literature on this topic and so I had to start from scratch. This led to the formulation of the second research question which became "Can historical and contemporary evidence be appraised and integrated to develop a robust CPD programme of Montessori-attuned, trauma informed practice?" From the outset, I suspected that there must be psychological and neuroscientific principles underlying Montessori's observations on the effect of *repetitive* activities on children's emotional and psychological states. Similarly, I suspected that there must be psychological and neuroscientific principles

underlying Montessori's observations on the transformative power of positive *relational* approaches in the healing of trauma affected children, as documented in her published lectures and books (Montessori, 2008, 1936). In my study of contemporary trauma-theory, I was drawn towards the work of the world-renowned clinician, developmental neuroscientist and child and adolescent psychiatrist, Dr. Bruce Perry and his acclaimed Neurosequential Network ([www.neurosequential.org](http://www.neurosequential.org)). In particular, I was drawn towards his work on the sequential nature of brain development and the problems that can arise when this sequential process is interrupted by traumatic events as expounded in his Neurosequential Model of Therapeutics (NMT) and his Neurosequential Model in Education (NME). When studying these models, I noted many commonalities between the neuroscientific principles underpinning the NMT and NME and the core principles of Montessori philosophy and education especially in relation to Montessori's understanding of the sequential nature of brain development, and the need for the first plane of development (birth to six years) to be well-established in order for the three subsequent (six year) planes to stand on a firm foundation, building the foundation for a healthy adulthood. Another striking commonality in both models is their emphasis on the potential for *repetitive* activities and positive *relational* approaches to help trauma-affected children. My study of the NMT/NME and a large body of other contemporary literature on trauma theory and practice, allowed me to integrate contemporary trauma theory with Montessori's original principles and practice and design a novel CPD programme of Montessori-attuned - TIP. It consisted of 4 modules which covered (a) Montessori's historical involvement with trauma-affected children; (b) trauma; (c) trauma-informed practice TIP; and (d) contemporary Montessori schools and TIP. This integration of new and old answered the second research question (above) and also led to the papers contained in chapters five and six.

Finally, I knew I would need to assess the impact, or perceived effectiveness of this novel CPD programme on teachers involved in early childhood/Montessori education. This led to the

third research question which was “What is the impact/experience of engaging in this new programme on the knowledge, attitudes, beliefs, and professional practice of teachers and what are their opinions on the feasibility of the programme?” To answer this question, it was clearly necessary to deliver the programme to a test school and evaluate its perceived effectiveness on the teachers. Therefore, the programme was presented to early childhood educators (n=11) at a test school over two semesters. The programme consisted of four, five-hour sessions delivered over the Autumn semester, with follow-up sessions and focus groups delivered in the Spring semester. The experience of presenting this programme and the interaction with the teachers over both semesters was one of the most meaningful and satisfying parts of this PhD project and one that I will never forget. It led directly to the paper contained in chapter seven.

In summary, the origins of this PhD lie in my personal observations over thirty years of the potential of the Montessori approach to bring psychological healing to trauma-affected children. With my curiosity aroused and my desire to find out if there was historical proof and a scientific basis for this psychological ‘healing’, I embarked on this PhD project. Now, reaching the end of what, for me, has been a fascinating journey through historical literature (which brought to life the classrooms, the trauma-affected children, the pedagogical approaches that appear to have brought psychological healing to children), as well as the compelling contemporary literature on trauma and TIP, especially the NMT and NME, I feel I must borrow, (not for the first time), the words of Dr. Maria Montessori –

“Once these facts have been seen, one cannot cease from writing and talking about them”

(Montessori, 1967/1949, p. 282).

# **CHAPTER 1**

## **Introduction**

### **1.1. Overview**

This chapter introduces the background and context of the study and positions the research within the broader field of trauma studies, trauma-informed practice in education, and Montessori education. It presents the research problem, and identifies the research aims and objectives. The specific research questions underpinning the research are outlined. The structure of the thesis is presented at the end of the chapter. This is followed by a brief summary of this chapter.

### **1.2. Background**

Childhood adversity is a global problem with 50% of all children experiencing at least one type of adversity each year (WHO, 2020). The seminal Adverse Childhood Experiences (ACE) Study, (Felliti et al., 1998) did not define childhood adversity, but identified it as exposure, before the age of 18, to stressors such as abuse (physical, sexual, or emotional), neglect (physical or emotional), household challenges (domestic violence, parental separation/divorce, household substance misuse, family mental health issues, or incarceration of a family member). In more recent years, other stressors such as exposure to poverty, homelessness, discrimination, racism, chronic illness or death of a family member, and other challenges, have also been identified as contributing to, or representing childhood adversity (Finkeldor et al., 2015; McEwen & Gregerson, 2018; Merskey et al., 2017). Equally widespread is childhood trauma, which refers to exposure to seriously stressful experiences



that overwhelm children and young persons under the age of 18 years (Substance Abuse and Mental Health Services Administration SAMHSA, 2014), making them feel “threatened, uncertain, unsafe,” (Wright, 2023, p. 97).

A compelling body of research demonstrates that exposure to childhood adversity and trauma can have detrimental impacts on children’s future health and well-being (Bellis et al., 2019; NSCDC, 2020; Shonkoff et al., 2012). In 2020, the National Scientific Council on the Developing Child at Harvard University, stated that early childhood development and lifelong health are deeply intertwined, and that children living in conditions of deprivation and/or threat may emerge into adulthood carrying greater risks for impairments to their physiological systems such as their cardiovascular function and immune responsiveness (NSCDC, 2020). Furthermore, there is now considerable evidence to demonstrate that exposure to adversity and trauma in childhood, is linked to the development of inflammatory markers in later life that are known to be associated with physical illnesses which include asthma, cancer, diabetes, autoimmune conditions, and cardiovascular disease (Chandrasekar, 2023). Research also documents the association between ACEs and mental health outcomes in adulthood, including psychosis, bipolar disorder, adult suicidality, and psychopathy (Matjasco, 2022).

The ACE Study also showed that the experience of adversity in childhood has a direct link to the adoption of unhealthy and even risky behaviours in adulthood such as misuse of alcohol or drugs, premature or risky sexual practices, or smoking, all of which are associated with both physical and/or mental ill-health in later life (Felitti et al., 1998). However, Shonkoff and colleagues (2012), state that even when an individual does not engage in unhealthy or risky behaviours in adulthood, exposure to toxic stress in early childhood has been shown to cause biological disruption that can lead to poor health outcomes in later life. Given these risks for future health and wellbeing, it is not surprising that collectively childhood adversity and trauma

have been described as a major public health challenge (Burke-Harris, 2019; van der Kolk, 2014).

Earlier research also showed that in childhood, the excessive or ‘toxic’ stress that typically results from early exposure to adversity and/or trauma can negatively affect the architecture of the developing brain potentially impeding the optimal development of memory, language skills, and learning capacity (NSCDC, 2014/2005). Exposure to adversity and trauma in childhood can also impact cognitive, social, and emotional functioning, thereby affecting a child’s ability to learn, form relationships, and function at school (Cole et al., 2005; Craig, 2016; Perry & Szalavitz, 2006; Treisman, 2017; Wolpow et al., 2016). This is particularly pertinent to the issue of systemic racism because recent studies argue that racism is a major life stressor for many children and young people (Bernard et al., 2020; Wilson et al., 2023).

In view of the growing research on the prevalence, consequences, and costs to governments arising from the negative effects of trauma, a global movement has developed to support institutions and systems, including schools, to become more ‘trauma-informed’ (Thomas et al., 2019). Although to-date, there is no universally agreed definition of ‘trauma-informed’ practice, there is a general consensus that it should include the four assumptions and six key principles outlined by the Substance Abuse and Mental Health Services Administration SAMHSA (2014). These four assumptions are, that a trauma-informed system *realises* the pervasiveness of trauma, *recognises* the signs of trauma, *responds* in their policies to the reality of trauma, and *resists* the re-traumatisation of service users. The six key principles are, that a trauma-informed system promotes safety, trust, peer support, collaboration, empowerment, and respect for cultural, historical and gender issues in its service users.

Educational settings are deemed to be ideal locations for the implementation of trauma-informed approaches firstly, because children typically spend a substantial part of their lives there, and secondly, because TIP should ideally be embedded as an educational goal in its own

right. Consequently, in recent years, there has been a move among educators to support schools in their journey to becoming trauma-informed (Alexander, 2019; Brooks, 2020; Brummer, 2021; Brunzell & Norrish, 2021; Jennings, 2019; Maynard et al., 2019; Nicholson et al, 2023; Thomas et al, 2019; Wright, 2023). The chief goal of trauma-informed practice is to promote psychological healing and prevent re-traumatisation.

### ***1.2.1 Montessori's Early 'Healing' Schools***

Historical evidence shows that over 100 years ago, an original approach to education pioneered by Dr Maria Montessori (1870-1952) in Rome, initially with children with various mental disabilities, and then with typically developing children, quickly became acclaimed for promoting psychological healing in children. Maria Montessori was one of the first women to gain a degree in medicine from the University of Rome. Following her graduation in 1896, she interned in psychiatry at the Psychiatric Clinic attached to that University. As a result of her work there, she became recognised as a proficient clinical psychiatrist, (Povell, 2010) and an expert in children's mental illnesses (Gutek & Gutek, 2017). She also became well known throughout Europe as an expert in education (Foschi, 2008), because of her great success in teaching many so-called 'unteachable' children from Rome's psychiatric hospitals, how to read, write and do basic arithmetic, and so pass the state examinations. A decade later, in 1907, she opened the first Montessori school, known as the Casa dei Bambini, in the impoverished district of San Lorenzo in Rome, and achieved remarkable success resulting in the spread of Montessori schools all over Italy and soon after, all around the world. As Babini stated "she carved out a remarkable career from psychiatrist to educationalist" (Babini, 2000, p. 45).

During the first two decades of her work, some of the children in Montessori's early classes (1897-1917) were survivors of traumatic events such as the Messina earthquake in 1908, and the Great War (1914-1918), which left most surviving children orphaned, homeless,

and traumatised; and many were also exposed to adversities such as poverty and neglect. During this time, Montessori's schools became renowned for fostering psychological 'healing' in children especially those affected by adversity and trauma (Bailey, 1915, Cromwell, 1916) and were acclaimed for taking preemptive steps to protect children from what was then described as "mental strain" (Stevens, 1912, p. 81; Tozier, 1911, p. 6). In fact, it is recorded that at a meeting of the British Psychological Society in December 1919, Dr. Hugh Crichton Miller, a prominent Scottish psychologist, and founder of the Tavistock Mental Health Clinic in London, stated "When the Montessori system is established in all schools, almshouses will have to be set up for the psychoanalysts" (Radice, 1920, p. 139).

This emphasis on the promotion of mental health in Montessori's early schools (1907-1917), and the recognition of her schools as environments that brought psychological healing to trauma-affected children, has been overlooked in contemporary literature, as has her attempts to establish an organisation to be called the 'White Cross' (Montessori, 2013/1917). This was conceptualised by Montessori as a means of complementing the work of the Red Cross by providing support for the psychological recovery of children who had experienced exposure to wars and natural disasters. One of the main responsibilities of this organisation was to be the provision of (what we would now call) TIP programmes for teachers and nurses to enhance their interdisciplinary knowledge about the effects of trauma, in order to help them in their efforts to support trauma-affected children (Montessori, 2013/1917).

### **1.3 The Research Problem**

As stated above, current literature on trauma has overlooked Montessori's experience and expertise in the area of psychological healing in trauma-affected children, and her promotion of positive mental health in her early schools, which were referred to as *Case della salute* or 'Health Homes' (Montessori, 1966, p. 181). This has led to a significant knowledge gap in the

literature which this research aims to address because knowledge of Montessori's historical approach to supporting trauma-affected children may provide valuable insights for contemporary educators who are facing the following two major challenges.

Firstly, childhood adversity and trauma are not only prevalent and harmful, but they are also currently on the increase owing to such social factors as the almost universal economic downturn following the COVID-19 global pandemic which increased poverty levels for many families. The stress associated with this, frequently contributed to marital and relationship breakdowns, resulting in the destabilisation of many children's lives (Absher et al., 2021; Taylor, 2021). Added to this, the increased frequency of natural disasters (e.g., earthquakes, storms, forest fires, floods and other turbulences caused by climate change, and the outbreak of wars), further contributed to levels of adversity and trauma for many children (O'Donnell & Palinkas, 2024). In addition, the rise of gun violence in some countries, (e.g., the U.S.) and increases in racially motivated crimes, have contributed to an increase in children's exposure to adversity and trauma, resulting in their rising levels of mental health difficulties (Holloway et al., 2023).

Secondly, many teachers feel ill-equipped to recognise the signs and symptoms of trauma and deal with the emotional, social, and cognitive difficulties that exposure to trauma can cause to children, and consequently, they sometimes feel overwhelmed trying to help these children (Craig, 2016). This author also stated that without a knowledge of trauma, teachers often misread potential indicators of traumatic stress, and she added that when teachers come to believe there is nothing they can do to facilitate what appear to be negative changes in children's behaviors, they often give up trying (Craig, 2016). Other authors on trauma have pointed out that without an understanding of trauma and its possible effects on children's behaviours, many children will be wrongfully misjudged, mislabeled, and often suspended or expelled from schools (Alexander, 2019; Jennings, 2019).

For these reasons, there is a sense of urgency among educators both nationally and internationally to see the development of trauma-informed practice programmes for teachers, to enhance their capacities to support trauma-affected children (Alexander, 2019; Jennings, 2019; Nicholson, 2023; O’Toole, 2018, 2019). Designing and providing access to high quality TIP professional learning programmes offers one way to address this need and knowledge of Montessori’s historical approach to supporting trauma-affected children may offer valuable lessons in this regard for contemporary educators.

## **1.4 The Research Aims, Objectives, and Questions**

### ***1.4.1 Aims***

The overarching aim of this research was to support teachers to help trauma-affected children by (a) investigating accounts of Montessori’s ‘healing’ schools (circa 1897-1917), which were reputed to have promoted psychological healing from trauma; (b) integrating the findings with contemporary trauma theory to inform the development of a novel trauma-informed practice Continuing Professional Development (CPD) programme for teachers in Montessori schools; and (c) evaluating the perceived impact, acceptability, and utility of this programme at a host school. The research also aimed to fill the knowledge gap in the extant literature, referred to above.

### ***1.4.2 Objectives***

The research comprised of three separate but related studies. The objectives were to:

- Integrate and blend historical evidence pertaining to Montessori’s early schools (which were recognised as healing environments) with contemporary knowledge on childhood trauma and trauma-informed education and practice. (*Study 1*).

- Use the above information to inform the development of a new and innovative professional CPD programme to support Montessori teachers to implement trauma-informed practice. (*Study 2*).
- Evaluate the perceived impact, (in terms knowledge, attitudes, beliefs, professional practice), utility, and acceptability of the new programme (*Study 3*).

### **1.4.3 Research Questions**

The research was guided by the following three research questions:

- What is the historical evidence supporting the claims that Montessori offered a ‘healing’ environment?
- Can historical and contemporary evidence be appraised and integrated to help inform the development of a new CPD programme of Montessori-attuned, trauma-informed practice?
- What is the perceived impact, acceptability, feasibility, and overall experience of the programme particularly with regard to the knowledge, attitudes, beliefs, and professional practice of teachers?

## **1.5 Thesis Structure**

The remainder of the thesis comprises 7 further chapters as follows:

**Chapter 2** consists of an extensive literature review on childhood trauma, childhood adversity, and trauma-informed practice (TIP) including an overview of some of the theoretical frameworks underpinning the research.

In **Chapter 3**, the research methodology is presented, including an overview of the epistemological and ontological framework, the research design (and justification) and methods, research positionality, as well as other methodological considerations.

**Chapter 4** presents the findings from Study 1, which involved a documentary analysis of historical evidence to critically examine the evidence supporting the claims that Montessori schools were ‘healing’ environments for trauma-affected children. This study was published as follows:

Phillips, B., O’Toole, C., McGilloway, S., Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. *Journal of Montessori Research*. Vol. 8 (1). pp. 13-28.

(An authorship declaration form relating to this paper can be found in Appendix F).

**Chapter 5** presents the findings from Study 2, exploring the alignment between the Montessori approach and the ‘Regulate Relate and Reason’ phase of the Neurosequential Model in Education (NME), (Perry & Graner, 2018). These findings were prepared for publication in 2024 and the paper is currently under review by the *Journal of Child and Adolescent Trauma* as follows:

Phillips, B. (Under Review). Does the Montessori Approach to Healing Trauma-Affected Children Align with the “Regulate, Relate, and Reason” Phase of the NME? A thematic Analysis. *Journal of Child and Adolescent Trauma*.

(An authorship declaration form relating to this paper can be found in Appendix F).



**Chapter 6** presents additional findings from Study 2 which focus on further commonalities between the NME and the Montessori model. The work was prepared and accepted for publication as outlined below:

Phillips, B. (2022). The Montessori Method and the Neurosequential Model (NME): A Comparative Study. *Journal of Montessori Research*. Vol. 8 (2). pp. 33-43.

(An authorship declaration form relating to this paper can be found in Appendix F).

**Chapter 7** is based on the findings of Study 3, which utilised a case study approach to explore and provide a rich contextual account of teachers' (n=11) experiences of engaging in a novel TIP focused programme of professional development. These findings were prepared for publication in 2024 and the paper is under review by the *Irish Educational Studies* journal as:

Phillips, B., O'Toole, C., Phillips, S, McGilloway, S. (under review). Assessing the perceived effectiveness of a newly developed trauma-informed practice (TIP) programme for early childhood teachers. *Irish Educational Studies*.

(An authorship declaration form relating to this paper can be found in Appendix F).

In **Chapter 8** a detailed discussion is provided. The chapter presents a summary of the key research findings in relation to the research aims, objectives and questions, as well as a detailed critical analysis and synthesis of the collective findings from the three independent studies. The overall implications, significance, and value of the findings to the field of Montessori research in particular, and TIP in general are discussed, alongside the strengths and limitations of the

research. The chapter concludes with a number of recommendations for future research, and for policy and practice.

## **Summary**

This chapter introduced the background to the study, briefly presenting the broader field of trauma studies, trauma-informed practice in education, and Montessori pedagogy. It positioned the research project within that field. It also presented the research problem, and identified the research aims and objectives. The specific research questions underpinning the research were presented, and the thesis structure was outlined.

## **CHAPTER 2**

### **Literature Review**

#### **2.1 Overview**

This chapter presents a comprehensive traditional review of the literature on childhood trauma, the Adverse Childhood Experiences (ACE) study, and trauma-informed practice (TIP). The aims of this literature review were to (a) select the most relevant peer reviewed literature on the topic of trauma and TIP, review and synthesise it highlighting the key arguments and disagreements; (b) identify the gaps in the literature, and by so doing provide a justification for the current research; (c) draw on the most established work to provide a theoretical framework for this research; and (d) use the literature review to inform the research methodology.

To carry out this literature review, a number of search engines were used including Google Scholar, Semantic Scholar, Research Gate, PubMed, ScienceDirect, CORE, ERIC, and JSTOR. Key terms included: - “childhood trauma”; “adverse childhood experiences”; “trauma-informed practice in education”; “trauma-sensitive”; “trauma responsive”; “trauma-informed models”; “stress”; “stress response”; “fight, flight, freeze”; “adaptive responses”; “state-dependent functioning”; “strength-based approaches in education”; “relationship-based approaches in education”; “whole-school approaches”; and “trauma-informed models in education”.

The chapter is divided into four main sections, which cover the foundational theories and empirical findings gathered from the literature review on (a) childhood trauma, (b) the Adverse Childhood Experiences (ACE) Study, (c) trauma-informed approaches (in general) and (d) trauma-informed approaches (in education).

## 2.2 Childhood Trauma

### 2.2:1 Definitions and types of trauma

According to the Substance Abuse and Mental Health Services Administration (SAMHSA), childhood trauma can arise from (3 E's) i.e., an *event* or series of events in which children are exposed to highly stressful *experiences* that overwhelm them, and which can have lasting adverse *effects* on their functioning (SAMHSA, 2014). This definition concurs with that of other trauma researchers who have described the negative effects of trauma on children's emotional, social, and cognitive functioning (Alexander, 2019; Brunzell & Norrish, 2021; Cole et al, 2005; Craig, 2016; Jennings, 2019; Nicholson et al., 2023; Perry & Szalavitz, 2006/2017; van der Kolk, 2014; Wright, 2023). However, some authors define trauma not as something that happened to a child, but rather as something that did not happen, such as being the recipient of love and nurture, in infancy and the early years (Mate, 2021). Another trauma specialist, Wright (2023) argues that the term *trauma* is frequently used incorrectly, and he seeks to re-define it. He says, "trauma is not the circumstances of one's life, it is the *response* to life challenges" and he adds that "not all adversity is traumatizing" (Wright, 2023, p. 96). He argues that we need to develop a more nuanced and accurate vocabulary for representing the experiences of children, their behaviours, and their emotional responses.

Overall, however, the most widely cited authors on trauma are in agreement that a traumatised individual is someone who has been 'wounded' psychologically, and research shows that these 'wounds' can negatively impact both mind and body (Burke Harris, 2019; Herman, 1997; Levine, 1997, 2007, 2010; Mate, 2019; Perry, 2001, 2009; Perry & Winfrey, 2021; Treisman, 2017; van der Kolk, 2014). Additionally, exposure to trauma in childhood has been linked to physical illnesses in later life such as heart disease, cancer, diabetes, and other chronic ills (Bellis et al., 2019; Burke-Harris, 2019; Chandrasekar et al., 2023; Felitti et al., 1998; Mate, 2019; NSCDC, 2020; Shonkoff & Garner, 2012).

These definitions of trauma, and the efforts to pin down what trauma actually is and how it affects the mind and body of an individual, were both relevant and important for the current research. Since one of the research objectives was to design and develop a trauma-informed programme of professional development for early childhood educators, it was vital to know how trauma is currently conceptualised and how it can affect the minds and bodies of developing children.

Researchers have categorised trauma into several different types or categories (Nicholson et al., 2023). These categories include: *acute trauma*, which refers to single incident traumatic events such as exposure to an assault, a car crash, a natural disaster, or the sudden loss of a loved one; *chronic trauma* which refers to such recurrent traumatic events such as frequent exposure to domestic violence, abuse, discrimination or racism; and *complex trauma* which refers to trauma that occurs within the child’s primary caregiving system, and it includes the emotional dysregulation and psychological damage of this exposure on the child. While trauma and stress are related, it is important to understand that not all stress is harmful (Perry & Winfrey, 2021).

### ***2.2:2 Trauma versus stress and the acute stress response***

Shonkoff & Garner (2012) and Harvard University’s National Scientific Council on the Developing Child NSCDC (2005/2014) classify stress as ‘positive’, ‘tolerable’, and ‘toxic’. They argue that ‘positive stress’ (such as starting a new school) is moderate, short-lived and a normal part of life and learning to adjust to it is a mark of normal, healthy development. Conversely, they state that ‘tolerable stress’, which they define as “nonnormative experiences that present a greater magnitude of adversity or threat” (Shonkoff & Graner, 2012, p. 235) such as dealing with the death of a loved one, or contentious parental separation/divorce, poses more

risks to the developing brain because it relates to events and experiences that have the potential to alter the brain in a negative way.

However, they state that a crucial element of tolerable stress is the availability of a supportive adult relationship which helps to buffer the physiological stress and aids the return to homeostasis or base line status. In addition, the NSCDC (2005/2014) state that these events and experiences typically occur over “briefer periods” of time thereby enabling the brain to recover and reverse any potentially harmful effects” (NSCDC, 2005/2014, p. 1). These authors also state that in some circumstances tolerable stress can even have positive effects, particularly if a child has the support of loving caregivers (NSCDC, 2005/2014). However, Shonkoff and Garner (2012) emphasise that in the absence of the buffering protection of a supportive, adult relationship, tolerable stress can become toxic (Shonkoff & Garner, 2012). This category of stress (which is caused by exposure to chronic, seriously stressful events that are out of the child’s control and are experienced without the child having access to support from at least one caring adult) can be very damaging to the developing brain because it involves “frequent, or prolonged activation of the body’s stress response systems” (p. 236).

Jennings (2019) describes the mechanisms involved in the stress response system. She explains that when a child (or adult) is exposed to an overwhelmingly stressful situation, the human stress response system is triggered. This results in the activation of a cascade of physiological, hormonal, and neurochemical reactions (Perry, et al, 1995; van der Kolk, 2014) originally designed by nature to help the organism to survive a dangerous situation by either fighting, taking flight, or freezing. This cascade of physiological, hormonal, and neural chemical reactions is time limited. When the dangerous situation has passed, homeostasis (i.e., a return to normal levels) should resume. However, when stressors are chronically present, and the stress response system is continuously re-activated, the body, especially specific brain areas, are placed at risk because of this excessive exposure to cortisol and the other stress

hormones that are released during the activation of the stress response. Indeed, studies show that if children are repeatedly exposed to experiences that they find to be extremely fearful, the structure/architecture of their developing brains can be harmed by the elevated levels of stress hormones in the blood stream (Burke-Harris, 2019; NSCDC, 2005/2014; Nicholson et al., 2023; Perry et al., 1995; Schore, 2003, 2008; van der Kolk, 2014; van Zomeren-Dohm et al, 2013).

This distinction between types of stress, and the assessment of their potentially harmful effects on the developing brain is important and directly relevant to the current research. Teachers working in early childhood need to be able to recognise and distinguish between the various types of stress they observe in the children in their classes. For example, a child experiencing toxic stress may behave in ways that appear to be defiant or unruly and may (wrongfully) appear to have learning disabilities (Perry, 1999). This problem which teachers frequently face, and which is actually caused by the repeated activation of the stress response deserves explanation. The problem occurs when trauma-affected children develop ‘adaptive responses’. These responses, which, most likely proved helpful at the time of the traumatic event, can become maladaptive over time, and can prevent the child from being able to function and learn in school (Alexander, 2019; Perry, 1999). These are explained in more detail below.

### ***2.2:3 Adaptive responses***

Research shows that when children experience or re-experience the activation of the stress response system, they may unconsciously develop ‘survival strategies’ or ‘adaptive responses’ usually referred to as hyper- or hypo-arousal (Perry, et al., 1995). Simply put, the term ‘adaptive response’ refers to how we respond to the disruption of the state of homeostasis (balance/normal levels) brought about by the activation of the stress response. The fight, flight

or freeze responses are essentially ‘adaptive responses’ which are often also referred to as ‘survival strategies’ (Perry, 2003, p. 12).

This knowledge is directly relevant to teachers, because in classrooms, hyper-arousal can manifest in a range of behaviours that appear destructive and which constitute either a fight response (e.g., screaming, kicking, shouting) - or a flight response (e.g., hiding under chairs, running away from the teacher/peers, refusing to join in a group). Conversely, hypo-arousal can manifest as – withdrawn behaviour, or a child appearing not to hear anything being spoken to them – (a freeze response) (Nicholson et al., 2023; Perry et al., 1995; 2003). Teachers need to be able to recognise and understand that some of the behaviours they observe in classrooms may well be adaptive responses or survival strategies that a child has had to use in the past, or is still using in the present, in order to escape a threat or possible danger. The challenge for many trauma-affected children is that these ‘adaptive responses’ - fight, flight, or freeze, (which were designed by nature only to be activated sporadically when the organism was faced with real danger), can become habitual and lead to persistent ‘state of arousal’ problems (Bomber, 2020; Sorrels, 2015) involving what Perry calls “state dependent functioning” (Perry, 1999). This is discussed in more detail below.

#### ***2.2:4 State dependent functioning***

‘State dependent functioning’ is a concept developed by Perry that explains why we absorb and process information differently depending on our state of mind, or more specifically, our state of arousal at the time of receiving any information. According to Perry, all functioning of the human brain is “state dependent” (Perry, 1999, p. 10), and therefore, “a traumatized child in a persisting state of arousal can sit in a classroom and not learn” (Perry, 1999, p. 10). Perry further points out that, when a child lives constantly in hyper-or hypo-aroused states, these can become maladaptive. Specifically, he states that “acute adaptive



states, when they persist, can become maladaptive traits” (Perry et al., 1995, p. 271). This means that a child’s adaptive responses (which were appropriate and necessary responses when they were at risk or in danger) can lead to permanent characteristics in the child’s behaviour and demeanor, so that “states become traits” and the neural systems in the child’s brain may become altered in ways that are not conducive to healthy development (Perry et al., 1995). Perry argues that a child may develop either the habit of dissociating/tuning out, being defensive, aggressive, or escaping from anything that appears threatening. Again, these neuroscientific findings point to the importance of raising teachers’ awareness of the possibility that when they observe children who are either aggressive, defensive, and convinced they are under threat, or the opposite, disinterested, in a world of their own, we may well be observing ‘habits’ formed by “state dependent” functioning (Perry and Graner, 2018).

## **2.3 Concepts and theories in trauma research**

To date, a wide range of concepts and attendant theories, related to trauma, have emerged and been developed within the international literature. This section will discuss those which would be considered most relevant to the present research, beginning with the most recently developed.

### ***2.3:1 The concept of a ‘window of tolerance’***

An interesting and helpful concept, referred to as the ‘window of tolerance’ was originally developed by Dr Dan Siegel, a clinical professor of psychiatry, and expert on trauma. According to Siegel (2020), each of us has a ‘window of tolerance’ in which we can tolerate various levels of emotional arousal without any permanent disruption to our overall functioning. This is a very useful and easily understood concept to explain that when a person is operating within their particular optimum zone or “window of tolerance” they can manage

and cope with their emotions without getting stressed to a harmful degree. When an individual is within the confines of this zone, they are typically able to function well, learn effectively, relax, play, and relate well with others and generally thrive in everyday life. Within this ‘window of tolerance’ an individual feels grounded, regulated, present, capable of being curious and interested in relating to others, and they are also able to cope when heightened emotions threaten to have a negative impact on them (Siegel, 2020).

However, if we are pushed beyond our ‘window of tolerance’ we can become hyper or hypo-aroused. According to Siegel, severe or repeated trauma, can lead to a change in an individual’s world view to the extent that they may begin to see threat where none exists. Consequently, their ‘window of tolerance’ becomes narrower, and even seemingly benign everyday challenges can cause them to over-react, displaying either destructive or withdrawn behaviour. The intensity of their response is, in itself an indication that the individual has been pushed beyond their ‘window of tolerance’. This concept has proven very helpful in applied settings including schools as a way to support practitioners in understanding dysregulated behaviour in children. In addition, it may be encouraging for teachers to know that (based on research evidence) most children can be helped to widen their ‘window of tolerance’ with simple strategies such as listening to quiet music or taking gentle exercise such as walking to calm them down if they are hyper-aroused. If they are the opposite, that is, hypo-aroused, then, activities such as, listening to fast-paced music to awaken their senses, or engaging in brisk exercise such as running to enervate themselves, will often prove helpful (Siegel, 2020).

### ***2.3:2 The ‘polyvagal’ theory***

A second theory that is relevant in relation to supporting trauma-affected children is the ‘polyvagal theory’ (PVT), first proposed in 1994 by the American psychologist, neuroscientist, and professor of psychiatry, Stephen Porges. This theory, which aims to provide an

understanding of the connections between brain and body processes from an evolutionary perspective was more fully developed by Porges in 2004. Despite the criticisms that it is not good science (Grossman, 2023), and oversimplifies and over emphasises the role of the vagus nerve in threat and social engagement, it paved the way for PVT to be used in psychotherapy, with many psychotherapists embracing it, and others dismissing it as pseudoscience. Basically, the PVT proposes that our nervous systems are genetically wired to continually scan the environment to check whether we are safe or at risk of danger.

Porges (2004) used the word “neuroception” to refer to the neural circuitry involved in our continuous, unconscious scanning of our environment. He proposes that if danger is sensed, we respond with a survival response, i.e., - fight/flight or freeze. Simply put, neuroception explains why infants smile when their parents or caregivers get close to them but become unsettled and cry when a stranger does the same (Porges, 2004). However, according to Porges, when neuroception tells us that we are safe and the people in our environment are not a threat to us, our defense mechanisms are “disabled ... and we can then behave in ways that encourage social engagement and positive attachment” (Porges, 2004, p. 24).

Porges emphasises the role of vocal intonation (e.g., angry or gentle) and facial expressions (friendly or threatening) in others as part of what we use to alert us to danger. However, he argues that following traumatic experiences, our neuroception can become “faulty” so that we misread these non-verbal signals leading us to perceive risk or danger when in fact our environment is safe (Porges, 2004). This concept has relevance for teachers and can help to explain why some trauma-experienced children often react defensively to the tone of voice or facial expressions of others (believing that they are being either mocked or threatened) when in reality, no negative message is being intentionally conveyed.

### **2.3:3 The PACE model**

Another model that has proven useful to many early childhood educators in their work with children who are trauma-affected, anxious or stressed (Begle & Dumas, 2011), is that developed by Hughes (2012). The PACE (Playfulness, Acceptance, Curiosity and Empathy) model was designed to provide a framework for caregivers of children who lack a secure emotional base, and consequently have difficulties with establishing trust. These caregivers are typically not the child's biological parents. It is based on the concepts of the child's need for safety and security. Its aim is to help anxious or fearful children to feel safe, unjudged, and uncriticised in the company of an adult who may be a foster parent, teacher, or therapist. It is used predominantly with children in the care system who are negatively affected by attachment and trauma issues and aims to promote a feeling of safety in these children in the course of their interactions with adults.

**Playfulness** involves having a lighthearted relationship with children in which they sense that the relationship is not conditional on their being perfect. Therefore, it reduces the shame children might take upon themselves when they feel that things have gone wrong in their lives. **Acceptance** refers to the action of letting a child know that they are not being judged and that their feelings are being responded to as valid regardless of how negative they may be. According to Hughes, acceptance usually involves sitting with the child as they pour out strong emotions such as 'no one likes me.' It involves listening non-judgmentally and showing them that they are accepted for how they feel while recognising that their feelings represent their perception of reality. **Curiosity** involves demonstrating a genuine interest in a child and in how they feel. However, Hughes suggests that it is better to avoid asking "why?" and instead ask questions such as "I wonder what makes you feel this" or "Would it be ok if I tell you what I think is going on here?" or "I may be completely wrong here, but this is what I think is happening." This approach shows a genuine desire to understand a child's feelings and

perceptions even if the listener does not agree with these perceptions. **Empathy** involves showing a child that we are standing shoulder to shoulder with them in their difficulties and genuinely trying to understand how they feel while going through such difficult circumstances. Hughes suggests that it may be helpful to express our own feelings such as “I feel sad that you think nobody cares about you”. It is important to note that each of the four elements, (Play, Acceptance, Curiosity, and Empathy) do not have to be present in every adult interaction with children with strong feelings or challenging behaviours, instead, they can be regarded as elements underpinning an adult/child relationship that enhances a child’s sense of safety and provides a secure platform for reframing children’s behavioural challenges over time.

## **2.4 The impact of trauma on children**

A vast and compelling body of research shows that children who have experienced traumatic events or who are experiencing ongoing exposure to traumatic events, frequently experience difficulties with their cognitive, emotional, and social functioning (Alexander, 2019; Burke-Harris, 2019; Cole et al., 2005; Craig, 2016; Jennings, 2019; NSCDC, 2020; Perry, 1999; Perry & Szalavitz, 2006/2017; Sorrels, 2015; Treisman, 2017; van der Kolk, 2003, 2014; Wolpow, 2016). Further information on each of these is provided below.

### ***2.4:1 Impact on Cognitive Functioning***

Considerable evidence suggests that those aspects of cognitive functioning most commonly affected by traumatic experiences include difficulties with concentration, verbal skills, and memory (Alexander, 2019; Cole et al., 2005; Craig, 2016; Jennings, 2019; Treisman, 2017; van der Kolk, 2003).

**Concentration.** With regard to concentration, van der Kolk, (2003) states that trauma-affected children tend to become hyper-vigilant and so preoccupied with “impending danger”

that, for example, they cannot concentrate in school (van der Kolk, 2003, p. 299), or their fears for their own safety make concentration very difficult or even impossible (Cole et al., 2005, p. 28). Treisman (2017) states that trauma-affected children “constantly scan the environment” in order to protect themselves from danger, while the other (non-trauma-affected children) just get on with their lessons (p. 31). Additionally, Sorrells, (2015) points out that trauma-affected children notice every sound, movement or change in the environment, making it very difficult for them to settle down and focus. She says, it is not the case that they are not paying attention to anything, but rather, they are paying attention to everything and for that reason are unable to distinguish between what is/is not important (Sorrells, 2015, p. 24). Conversely, as Streeck-Fisher and van der Kolk, (2000) point out, trauma-experienced children may have developed the habit of “disengaging from the world” by dissociating, tuning out, daydreaming, or going into a world of their own (Streeck-Fisher & van der Kolk, 2000, p. 911). In severely trauma-affected children, dissociation can give a child a sense of “just floating” or “watching a movie” with them playing a part in it (Perry et al., 1995, p. 281). To the on-looker, these children appear as though they are “daydreaming”, “staring off into space with a glazed look” (Perry et al., 1995, p. 281). This mental state can make concentration in school, either very difficult or impossible.

This negative impact of trauma on a child’s ability to concentrate is well documented in the literature (Cole et al., 2005; Craig, 2016; Perry, 1999; van der Kolk, 2003), and is directly relevant to teachers working in early childhood settings because teachers are often bewildered by children’s inability to focus on anything for very long. Thus, an understanding of the neuroscience behind this inability to focus, may help teachers to have a more empathic and compassionate approach. The issue of concentration is particularly relevant in the Montessori context because of the huge emphasis Montessori placed on the phenomenon of concentration on a task, that she observed in her schools, (Montessori, 1936, 1964) and the similarities

between her discoveries about concentration and those of contemporary ‘flow’ theory (Csikszentmihályi, 1990; Rathunde, 2023).

*Verbal skills.* With regard to verbal skills, children who have been exposed to trauma, or who are experiencing ongoing trauma in their lives, frequently demonstrate problems with both expressive and receptive language. For example, some interesting early studies found a correlation between deficits in both receptive and expressive language in children who had been exposed to neglect (Allen & Oliver, 1982). These authors hypothesise that the lack of stimulation experienced by these children most probably accounts for these findings.

Cole and colleagues also point out that children who have been impacted by trauma “may have a relationship to language that is different from that of their non-traumatised peers” (Cole et al., 2005, p. 24). Early studies also show that the development of communication is influenced by the interactive styles and social context in which early language is established (Coster & Cicchetti, 1993). These authors explain that when a child lives in a home where the caregiver’s primary verbal interactions with the child are focused on controlling the child’s behaviour rather than addressing the child’s thoughts and feelings, the child may develop a chiefly ‘instrumental’ understanding of language. This can lead to the child having difficulties in conveying abstract ideas, and also experiencing challenges with the basic ability to engage in dialogue and narrative, with peers and adults, which is so necessary for normal social exchange.

In an early study, Craig (1992) suggested that traumatised children may also have difficulty focusing on the content of language simply because they are fearful and are always monitoring non-verbal messages, (Craig, 1992, p. 68). Research also shows that triggers evoking the recollection of traumatic events can impact language areas in the brain with the result that the area most associated with language (e.g., Broca’s area) may become “less active” (Cole et al., 2005, p. 24). Some specialists argue that if teachers were more knowledgeable

about these triggers, they could take steps to help children avoid them, thereby preventing any kind of re-traumatisation (Treisman, 2017).

In summary, this impoverishment of verbal skills in trauma-affected children poses very real problems in terms of their cognitive functioning. Teachers use language to teach and especially to teach abstract ideas. Thus, children who lack appropriate verbal skills are at a disadvantage academically. Linguistic competence is also necessary to allow children to explore ideas. It follows then, that children with an impoverished vocabulary, or those who struggle with syntax and grammar may also struggle to contribute to class discussions which may hinder higher levels of overall development.

**Memory.** With regard to memory, children who have experienced traumatic events frequently exhibit poor memory skills which, according to some authors, may be related to damage to the hippocampus caused by surges of high levels of cortisol in the bloodstream during the acute stress response (Nicholson et al., 2023). For example, over two decades ago, memory specialist, Bremner (2006), pointed out that the hippocampus, an area of the brain involved in verbal declarative memory, is highly sensitive to stress (Bremner, 2006). Other early researchers on memory, for example, Nelson and colleagues (1998) also stated that parts of the brain that are critically involved in memory are uniquely impacted by stress.

#### **2.4:2 Impact on Emotional Functioning**

The impact of trauma on emotional functioning typically manifests as difficulties in regulating emotions and/or in forming attachments (Alexander, 2019; Cole et al., 2005; Jennings, 2019, Nicholson et al., 2023; Perry, 1999; Sorrels, 2015; Treisman, 2017; van der Kolk, 2003, 2014).

**Difficulties regulating emotions.** With regard to difficulties regulating emotions, it has been suggested that trauma-experienced children are extremely sensitive to emotional triggers



(Jennings, 2019; Wright, 2023); thus, a sight, a sound, a smell, a taste, a touch, however innocuous, can catapult a trauma-affected child from an apparent (but deceiving) state of calm, into a heightened state of emotional dysregulation. Likewise, in earlier research, Cole and colleagues (2005) indicate that children who have been affected by trauma often experience fear, anxiety, irritability, helplessness, anger, shame, depression, and guilt, but their capacity to identify and express these feelings “is often underdeveloped and poorly regulated” (Cole et al., p. 30). Thus, they often appear to be impulsive, out of control, aggressive, oversensitive, and unable to be reflective about their emotional outbursts.

In a school context, these children may frequently appear to overreact to what they perceive to be ‘provocation’ in the classroom and in the playground, and their outbursts are often referred to as ‘*externalising*’ behaviour (Alexander, 2019). Conversely, they may “block out painful or uncomfortable emotions” thus appearing to be “disinterested, disconnected, or aloof” and their withdrawal is often referred to as ‘*internalising*’ behaviour (Cole et al., p. 30). According to van der Kolk (1998) when children lack an understanding as to why they feel as they do, and also do not have the verbal capacity to describe how they feel, they are also at risk of developing ‘somatic’ (bodily) symptoms including headaches, stomach pains eating disorders, body-image concerns, fatigue, and a general feeling of being unwell (van der Kolk, 1998). More recently, it has been suggested that the inability of trauma-experienced children to appropriately regulate their emotions may be caused, at least in part, by the fact that they have a lack of understanding of their own emotions coupled with an inability to name them (Jennings, 2019).

***Attachment difficulties.*** According to van der Kolk (2003), trauma-affected children, frequently have problems with attachment. A wealth of literature highlights the importance of attachment which, according to Bowlby (1969/1982), refers to the formation of a close emotional bond between an infant/child and their adult caregivers. An attachment may be

‘secure’, ‘insecure’, ‘ambivalent’ or ‘avoidant’ (Ainsworth, Blehar, Waters, & Wall, 2015/1978) with ‘secure’ leading to the healthiest outcomes. Research shows that a child who is securely attached will have a ‘template’ for developing other healthy interpersonal relationships in the future (Schore, 2003, 2008). Moreover, a child who has had the benefit of a secure attachment in early life will have a ‘built-in’ protective element against the negative effects of exposure to trauma, and the experience of having a secure attachment in early life, will act as a buffer against the activation of the stress response (Treisman, 2017).

However, it follows that a child who does not have the experience of a secure attachment in early life, has no protective buffer against this type of extreme stress. Treisman’s stance is in line with van der Kolk who states that - “The security of attachment bonds seems to be the most important mitigating factor against trauma induced disorganization” (van der Kolk, 2003, p. 295). Treisman (2017) argues that in the case of complex trauma, where the child and attachment figure (usually the caregiver) had a relatively secure relationship which was then broken when the caregiver became the source of the child’s trauma, the child's sense of betrayal and confusion is devastating (Treisman, 2017). This situation leads to the child becoming wary of any further attachment regardless of how sympathetic the new person (teacher, foster parent) might be (Treisman, 2017).

Alexander points out that many children have experienced trauma at the hands of their “trusted” caregivers (Alexander, 2019, p. 25). Importantly, Sorrels (2015) points out the seeming contradiction that children who have been harmed in the context of a relationship can only be healed in the context of a relationship (Sorrels, 2015), and she states that this relationship needs to be one marked by “trust and unconditional acceptance” (p. 47). Research shows that teachers are often among the persons who may be able to provide that trust and unconditional acceptance to the child (Wright, 2023). The literature on attachment and the difficulties experienced by trauma-experienced children around the control of emotions, is

directly relevant to teachers working in early childhood settings because teachers are often bewildered by some children's inability to control their feelings and emotions (Brooks, 2020). An understanding of attachment and how traumatic experiences (especially at the hands of a formerly trusted caregiver, such as a parent), can leave a child emotionally volatile, confused, and fearful of trusting anyone, may help teachers to have a more compassionate approach to children (Brooks, 2020).

### ***2.4:3 Impact on Social Functioning***

Lastly, experience of, and exposure to, traumatic events can also impact on different aspects of social functioning including difficulties in making and sustaining friendships, unease in social situations, and challenges doing what peers are doing (Cole et al., 2005). Further information on each of these challenges is provided below.

***Difficulties making and sustaining friendships.*** Craig (2016), states that children who have experienced traumatic events in their lives frequently exhibit difficulties making and sustaining friendships and may be seen by peers as “unpredictable playmates”, unable to follow the rules of social engagement, thereby creating challenges for themselves in terms of developing and maintaining friendships (Craig, 2016, p. 51). One of the reasons for this lies in the tendency of trauma-affected children to misread non-verbal cues, such as the facial expressions, tone of voice or body language of their peers (Nicholson, 2023). Van der Kolk (2003) wrote that children with histories of trauma often have problems accurately reading social cues and are often out of tune with other children. Moreover, he states that because they typically have difficulty regulating their emotions, they “tend to scare other children away and lack reliable playmates and chums” (van der Kolk, 2003, p. 299). Perry (1999) states that trauma-affected children have learned the hard way to be hyper-vigilant to non-verbal signals. They have experienced how a look, a tone of voice, a bodily stance, can very rapidly becoming

a precursor to a frightening incident. This hyper-sensitivity to non-verbal cues, coupled with the fact that trauma-affected children are often in a 'low level state of fear' much of the time (Perry, 1999, p.10) can lead these children to reach the wrong conclusions about what they are sensing through non-verbal signals. He claims that as a result of having experienced frightening events, these children subconsciously remain in a state of hyper-vigilance in relation to non-verbal cues. Sorrels (2015) highlights that trauma-affected children notice looks, tones of voice, and bodily movements that other children, who have never experienced trauma would not even register. Craig states that this kind of hyper-vigilance can prevent trauma-experienced children from making and maintaining friendships with other children (Craig, 2016).

***Unease in social situations.*** With regard to trauma-affected children's sense of unease in social situations, Cole and colleagues suggest that this may be caused by the fact that trauma-affected children often have insecure relationships with adults outside of school and this can have a knock-on effect with their relationships with school personnel (Cole et al., 2005). Basically, these trauma-experienced children may be distrustful of adults and also, they may not feel physically or psychologically safe in school. According to Perry (1995), trauma-affected children are usually in a low-level state of fear at any given time. This could explain their state of unease in social situations. Since these children are constantly alert to the possibility of harm or danger, they cannot relax. Cole and colleagues state that most children impacted by trauma "do best in a calm environment that accepts no bullying or teasing and similarly they do best in an environment in which firm limits are set on negative behaviour" (Cole, 2005, p. 35). This literature relating to the difficulties experienced by trauma-experienced children in social situations is directly relevant to teachers working in early childhood settings. Teachers are often frustrated and puzzled by some children's inability to function well in social situations such as in the playground at recess. An understanding of why trauma-affected children have a tendency to feel unease in social situations may be helpful to

teachers and enable them to be patient and compassionate towards these children. It is worth noting that from the outset, Montessori environments were recognised as being calm environments where bullying and negative behaviour were at a minimum (Phillips et al., 2022).

***Challenges doing what their peers are doing.*** With regard to the challenges experienced by trauma-affected children in relation to doing what their peers are doing, Cole and colleagues point out that they may suffer delays in the development of age-appropriate social skills which may prevent them from being able to do this (Cole et al., 2005). According to Coster & Cicchetti (1993) these children may have difficulty understanding the meanings of words, and this might explain why they could experience difficulties following instructions as their peer group does. Craig (1992) pointed out that children coming from homes which are somewhat chaotic or with very few routines, may not have developed sufficient levels of sequential memory to enable them to follow the necessary sequence of steps in a lesson or a game (Craig, 1992), leaving it likely that their peers may oust them from the game. Similarly, if they cannot follow a sequence of steps in a lesson, they may fear that the teacher may get irritated with them, and they may decide not to participate for fear of embarrassment or public reproof. Ultimately, the greatest challenge to the ability of trauma-affected children to do what their peers are doing is their tendency to dissociate and remove themselves psychologically from their environment. As already stated, this tendency to dissociate when feeling under threat, frequently becomes an unconscious habitual behaviour in children who have been exposed to trauma (Perry, 1995). Once again, the literature relating to the difficulties experienced by trauma-affected children with regard to their social functioning is important and relevant to early childhood teachers working with children who may have been affected by trauma because it provides a rationale for behaviours that are often both puzzling and upsetting to teachers trying to get through their busy daily schedules.

Although the potentially detrimental effects of childhood trauma on the emotional, social, and cognitive development of children have been known for decades, the prevalence and common causes of trauma were not really highlighted until the landmark Adverse Childhood Experiences (ACE) study, which is discussed in the next section.

## **2.5 The Adverse Childhood Experiences (ACE) Study**

The Adverse Childhood Experiences (ACE) study (Felitti et al., 1998), is an on-going collaborative research study conducted by the Centres for Disease Control (CDC), in Atlanta, Georgia, and the Kaiser Permanente Health Group in San Diego, California, USA. It is the largest study ever conducted to examine, over the lifespan, the effects of adverse childhood experiences on adult physical and mental health, as well as on later social and economic well-being. This study provided a significant amount of the foundational data upon which TIP is built and so it is highly relevant to the current research. The initial phase of the ACE study took place from 1995 to 1997 and the participants were followed-up over a prolonged period of time to track and monitor their long-term health outcomes. The co-principal investigators were Dr Robert Anda of the Centers for Disease Control and Prevention (CDC) and Dr Vincent Felitti of the Kaiser Permanente Medical Group. More than 17,000 Kaiser Permanente patients, having undergone a standard physical examination, volunteered for the study and completed a confidential survey. This survey contained questions about their childhood experience or non-experience of abuse, neglect, or family challenges, collectively referred to as “family dysfunction”. This information was then combined and linked to the patient’s most recent physical examination, and this formed the baseline data for the study. The participants were mostly middle-income Americans, typically aged in their late 50s (Mn=57) and approximately half of whom were female; almost three quarters were Caucasian.

The overarching aim of the ACE study was to investigate the impact of stressful or traumatic childhood experiences on several aspects of health and well-being in later adulthood. Specifically, the aim of the study was to examine the link between stressful and traumatic events experiences in childhood and the development of behaviours that result in disease, disability, social problems, and even premature death in adulthood. Some of the concepts for the study had their origins years earlier when, Dr Vincent Felitti, while working at the Kaiser Institute as a specialist in preventative medicine, discovered that people with obesity issues, who were very successfully losing weight through his weight loss programme were precisely the people dropping out of the programme. This did not make sense until, Felitti, on delving more deeply discovered that a significant number of these individuals, had been sexually abused in childhood. Felitti made the connection that these people were subconsciously using obesity as a protective measure against further sexual abuse. These findings indicated that although these individuals were being treated for obesity, their obesity was in fact, a mere manifestation of a deeper problem, and that problem was early childhood trauma. This trauma was clearly caused by exposure to adverse childhood experiences (ACEs), in this case, specifically to childhood sexual abuse. It also became clear that some of these individuals had previously turned to smoking, drinking alcohol, or taking street drugs to alleviate the stress, anxiety, and despair they suffered. In many cases, it became clear that the obesity, although it was the most visibly obvious of the patients' problems, was actually a less serious and debilitating issue than the hidden problems that had led to the obesity. While Felitti was making these discoveries, Dr Robert Anda was studying a multitude of medical and public health issues including obesity, alcohol abuse, smoking, and various chronic diseases and he was curious about the possible psychological causes of these problems. Following an introduction, Felitti and Anda's interests merged into what became known as the Adverse Childhood Experience Study or the 'ACE study'.

For the purposes of the study, 10 individual types of adversity (occurring before 18 years) were broadly categorised under the headings – Abuse, Neglect and Household challenges. The 10 individual types of adversity were – emotional, physical, or sexual abuse; emotional or physical neglect; parental separation/divorce, domestic violence, household substance misuse, mental health issues, incarceration. Participants were asked to indicate on the ACE Questionnaire whether or not they had been exposed to any of these adversities before the age of 18.

### ***2.5:1 The ACE study findings***

The major findings of the ACE study were that Adverse Childhood Experiences (ACEs) are: (1) common; (2) interrelated; and (3) present a common pathway towards negative behaviours that can lead to disease, disability, social problems and sometimes, premature death. The specific findings were that only 1 in 3 of the participants reported no ACEs; as many as 2 out of 3 reported at least one ACE; more than 1 in 5 reported three or more ACEs, while 1 in 10 had experienced five or more.

The ACE Study demonstrates clearly and persuasively that extremely stressful or traumatic experiences in childhood such as abuse, neglect, witnessing domestic violence, or growing up with household substance abuse, mental illness, parental conflict, incarceration of a parent, are a common pathway to social, emotional, and cognitive challenges that can lead to increased risk of unhealthy behaviours, risk of violence or re- traumatisation, as well as disease, disability, and premature death. Thus, in summary, according to Felitti and colleagues (1998), ACEs can lead to behaviours that, in turn, can lead to disease/disability, social problems, and even early death (Felitti et al., 1998).

The ACE study findings also revealed that adverse childhood experiences tend to occur in groups or clusters rather than as single experiences. Thus, as the number of adverse



experiences in childhood increases, so does the risk of future vulnerability to disease, disability, social problems, and premature death. One finding of particular concern is that persons with an ACE score of 4 or more were twice as likely to be smokers, to have cancer and/or heart disease, six times more likely to have become sexually active before 15 years, seven times more likely to abuse alcohol, ten times more likely to inject street drugs; and twelve times more likely to have attempted suicide.

### ***2.5:2 The ACE study's limitations***

The ACE study has been criticised on a number of levels (Kelly-Irving & Delpierre, 2019). Key criticisms of relevance to the current project include firstly, its failure to include adversities associated with inequalities such as – “child poverty, racism, economic and racial segregation, unaffordable housing, stagnant wages, and weak social supports for parents and caretakers” (McEwen & Gregerson, 2019, p. 790). It has also been criticised for not including such adversities as peer rejection, exposure to violence outside the family, low socio-economic status, and poor academic performance (Finkelhor et al., 2013).

Furthermore, O’Toole (2022) highlights that the original ACE study did not include experiences such as the death of a family member or living with a chronic illness or disability as highlighted by Johnstone & Boyle (2018). She points out that when these experiences are also considered, the widespread nature of childhood adversity is even more apparent. O’Toole further suggests that these events are often not individual experiences, but many (such as neighbourhood violence or racism) are experienced collectively by members of particular social groups or communities. She goes on to say that the causes of community trauma often lie in historic and ongoing social inequalities which include poverty, racism, and oppression (O’Toole, 2022). These criticisms relate directly to this research project because educators need

to be made aware that many of the causes of adversity and trauma have their roots in social injustices.

Secondly, the ACE study fails to consider the timing of the adversity or the age of the child when exposed to it, as well as its duration. As Perry has shown, the timing of the adversity is crucial “because the brain is most plastic (receptive to environmental input) in early childhood”, and while “experience may alter the behaviour of an adult, experience literally provides the organizing framework for an infant and child” (Perry, 2001, p. 25, 2009, p. 245). Thus, adverse experiences in early childhood, can be very impactful because this is the period when the brain is undergoing a very intense period of neural development (NSCDC, 2005/2014). This issue of the timing of the experience of adversity or trauma relates directly to this research project and specifically to the Montessori model for children under six years.

Thirdly, according to (Matjasko et al., 2022), the ACE study appears to be too deterministic in not referring to the ‘protective factors’ which can buffer the toxic stress that can develop as a result of such exposure. Chief among these protective factors are: having at least one positive relationship; having a sense of agency over one’s destiny; learning to label and to manage our emotions; having a sense of belonging and being accepted within our family, or community.

These resilience factors should always be considered during discussions of the original ACE study findings in order to dispel the notion that the research is deterministic, and that people cannot thrive following exposure to adversity. The literature relating to resilience is important to this research project and relevant to early childhood teachers working with trauma-affected children. Teachers should be aware of the positive and potentially life changing role they can play in a child’s life. This knowledge may be empowering to teachers who otherwise might feel powerless and ineffective.

Fourthly, the original ACE study has been criticised for its use as a measure of individual health risk as opposed to population health risk (Anda et al., 2020). This issue is relevant to the current research because teachers should be alerted to the fact that, although knowledge of the ACE study (including the ACE questionnaire) is very important, it was not the intention of the study's principal investigators that the ACE questionnaire be used as a diagnostic or assessment tool for individual use (Anda et al., 2020).

Fifthly, the original ACE study is considered by some to be overly simplistic. For example, according to Lacey & Minnis (2020), while the ACE score approach has an intuitive and practical simplicity, in terms of its potentially wide-ranging applications in health practice and public policy, it may be too simplistic with regard to conveying risk/causality or stigma. In the current research, it was important to be careful not to take an over-simplistic approach to the ACE findings but to remember that other factors, especially resilience factors play a significant role in human health and wellbeing.

Sixthly, participants in the original ACE study were predominantly white middle-class individuals with private health insurance (because Felitti was working for Keiser Permanente and the participants were subscribers to that private health insurance company), which left it open to criticisms of unrepresentativeness (Mc Ewen and Gregerson, 2019). However, since the original work, other studies have been carried out with different cohorts and with similar findings. The current literature on the issue of the representativeness of the ACE study is relevant to the current research project in that it raises awareness that the childhood roots of adult chronic disease and ill-health are the same in both predominantly white and in racially diverse populations.

Lastly, Kelly-Irving & Delpierre (2019) allude to a number of methodological flaws in the original ACE study, including, for example, the self-reported and retrospective nature of the data, thereby illustrating its susceptibility to recall bias (Kelly-Irving & Delpierre, 2019).

### **2.5:3 *The ACE study's on-going influence***

On the positive side, however, the ACE study should be regarded as seminal research which laid the groundwork for many further studies. For example, McEwen and Gregerson (2019) wrote that –

“Placing ACE research - and the movement it has generated – in the wider context provided by the social determinants of health framework, and by the rapidly growing biology and neuroscience of early childhood adversity, can enrich ACE research and extend its impact to shaping primary prevention policies that address social and economic conditions producing adversity” (McEwen & Gregerson, 2019, p. 790).

These authors (referring to Felitti et al., 1998) also state that: “Their work has catalyzed a large body of research and inspired an influential movement on behalf of trauma-informed institutions and resilience-building efforts” (p. 790). These authors point out that the ACE study has been widely popularised (e.g., through numerous training courses, networks, and media). They particularly stress the importance and future potential of the fact that (as stated above) parallel research in the area of neuroscience and into the serious adversities experienced by children have been “imported” into the ACE movement and attendant training courses under the name “ACEs Science” (p. 790). Finally, the ACE Study provided a significant amount of the foundational data upon which TIP is being built, thus the ACE study and its findings are crucial to the current project.

## **2.6 Trauma-Informed Practice (In General)**

According to Blodgett & Dorado (2019), the starting point for most trauma-informed practice goes back to the scientific findings of the ACE study. (Blodgett & Dorado, 2019). The concept of trauma-informed care originated in 2001 when Maxine Harris and Roger Fallot, the

pioneers of trauma-informed care, published a groundbreaking paper in which they stated that practitioners treating people receiving services in mental health and addiction systems need to become informed about the impact and the aftermath of trauma (Harris & Fallot, 2001). They defined trauma-informed services as services whose mission is informed and consequently altered by an interdisciplinary knowledge and understanding of trauma and its impact on the lives of those using the service (Harris & Fallot, 2001). In 2004, Sandra Bloom added to this work by explaining how the minds and bodies of individuals are affected by severe stress and how this stress can impact individuals, organisations, and whole nations (Bloom, 2004).

According to SAMHSA (2014), a trauma-informed organisation should be “grounded in a set of four assumptions and six key principles” (SAMHSA, 2014, p. 9). The four assumptions they list are: firstly, that a trauma-informed organisation realises the widespread impact of trauma and understands the potential paths for recovery; secondly, it recognises the signs/symptoms of trauma in clients/family/staff and others; thirdly, it responds by fully integrating knowledge about trauma into its policies/procedures/practices; and fourthly, it resists the re-traumatisation of clients/staff and others in an active way.

SAMHSA elaborates on these four assumptions explaining that everyone throughout all levels of an organisation need to have a basic “realisation” about trauma and how it can impact individuals, groups, organisations, families, and wider communities. They also explain that a trauma-informed organisation *realises* that trauma-experienced individuals have usually been forced to develop survival or coping strategies to help them to manage experiences that they found to be overwhelming. These experiences may include *past* events involving stressors (e.g., abuse), *current* events involving stressors (e.g., domestic violence), or *past* or *current* vicarious trauma brought on by hearing about another individual’s trauma.

SAMHSA also point out that a trauma-informed organisation *realises* that many individuals’ issues with substance misuse and/or mental health may have their roots in exposure

to traumatic experiences that need to be addressed in treatment, recovery, and prevention settings. Moreover, they state that a trauma-informed organisation *realises* that trauma exists in other systems including the criminal justice system, and the child welfare system, and that it is often a barrier to effective outcomes therein.

With regard to the recognition of trauma, SAMHSA states that a trauma-informed organisation can *recognise* the signs and symptoms of trauma which are often specific to a particular age-group, gender, or other factor. This ability is promoted through workforce development, and by supporting employees through appropriate supervision and guidance. Importantly, they say that a trauma-informed organisation *responds* by integrating the principles of a trauma-informed approach throughout the organisation. This is reflected in the organisation's specific mission statements, their staff handbooks, and manuals, all of which should aim to promote a "physically and psychologically safe environment" (p. 10) and a culture oriented towards resilience and trauma recovery. The organisation also *responds* by "providing a physically and psychologically safe environment" (p. 10). Finally, according to SAMHSA, a trauma-informed organisation should actively seek to *resist the re-traumatisation* of clients and staff by teaching staff to recognise how practices within an organisation (e.g., placing a child who has experienced neglect in a seclusion room) may trigger painful memories and re-traumatise individuals with trauma histories.

In addition, according to SAMHSA (2014) – and as mentioned briefly in Chapter 1, a trauma-informed organisation or system should adhere to the following six key principles: 'Safety'; 'Trust and Transparency'; 'Peer Support'; 'Collaboration and Mutuality'; 'Empowerment, Voice, and Choice'; and 'Cultural, Historical, and Gender Issues'. Thus, in a trauma-informed organisation or system, all staff, and the people they serve, should feel physically and psychologically safe, while all decisions affecting the organisation should be made with transparency and aim to build and maintain trust with clients and their family

members and with anyone involved in the organisation. A trauma-informed organisation recognises that peer support, mutual self-help and empowerment are key factors in helping to promote recovery, and that healing happens in relationships and in the meaningful sharing of power and decision-making. It promotes the voices and choices of both staff and clients and attempts to move beyond historical and cultural stereotypes and biases (e.g., based on age, race, ethnicity, sexual orientation) and offers culturally responsive services, while recognising and addressing historical trauma. These four assumptions and six key principles as outlined by SAMHSA (2014) have been identified as the core principles underlying many of the TIP approaches that have emerged over the last two decades, and they were also used to guide and inform the current research.

## **2.7 Trauma-Informed Practice (In Education)**

The last two decades have seen a significant growth in the literature relating to the prevalence of childhood trauma and the extent of the social, emotional, and cognitive harm it causes to children (Thomas et al., 2019). It is not surprising therefore, that for more than a decade, a movement has developed to make systems, including schools, trauma-informed (Lang, Campbell, & Vanerploeg, 2015). In recent years, there has been a clear sense of urgency among educators to promote trauma-informed practice in education (Alexander, 2019; Brooks, 2020; Brummer, 2021; Brunzell & Norrish, 2021; Craig, 2016; Cole et al., 2005, 2013; Jennings, 2019; Nicholson, 2023; Venet, 2021; Wolpow, 2009; Wright, 2023). In 2019, Thomas and colleagues correctly pointed out that there is no dominant or formally agreed upon framework for trauma-informed practice in education (Thomas et al., 2019), and this is still the case today.

However, despite this lack of a dominant framework, much of the trauma-related resources designed for educators use the TIP approach (based on the four assumptions and six

key principles outlined above) developed by SAMSHA (2014). Furthermore, a general consensus has emerged among educators about the criteria required to enable a school to become trauma-informed. This consensus accepts that there are at least five related elements working together to support a school to become trauma-informed. These include seeing TIP as an approach that: changes our perspective; is relationship-based; is strengths-based; promotes safety, collaboration, and empowerment; and takes a whole school perspective.

### ***2.7.1 A perspective change***

With regard to TIP in education as a potentially perspective changing approach, Thomas and colleagues, (2019), state that such an approach, by “shifting the question from ‘what is wrong with you?’ to what is happening with you?” can lead to changes in the educator’s point of view (Thomas et al., 2019, p. 428). Likewise, Alexander (2019) refers to this as “a mindset change for educators” (Alexander, 2019, p. 82). Moreover, she points out that we do not need to know all the details of a child’s life, but only that the child has been affected by trauma and therefore is more likely than not to demonstrate behaviour in school (often quite suddenly, and often because of some trigger of which we are unaware), that has to do with the *fight flight or freeze* response. Alexander (2019) provides an interesting and useful example of a student who, by all appearances looked like he was being defiant, and disruptive every day in the school cafeteria. However, a knowledge of ‘what happened to him’ revealed that he lived with domestic violence and he did not feel safe when he had to sit in the cafeteria with his back to other children, as this made him feel vulnerable and he quickly became dysregulated, and behaviour problems followed (Alexander, 2019). According to Alexander, had the staff known earlier what was triggering this student, they could have allowed him to sit with his back to a wall or a window which would most likely have helped him to feel less vulnerable. This approach is important because it changes our stance from responding to a child



using a deficit lens, to responding to a child using a trauma-informed lens, thereby altering our perspective, and reducing the likelihood that we will mis-judge or mis-label a child.

### **2.7.2 *A relationship-based approach***

With regard to trauma-informed practice in education as a relationship-based approach Perry & Szalavitz (2006) state that “the more healthy relationships a child has, the more likely he will be to recover from trauma and thrive (Perry & Szalavitz, 2006, p. 230). The research shows that healing from trauma comes about predominantly through positive relationships (Ludy-Dobson & Perry, 2010) and a TIP approach acknowledges that healthy relationships are key to the healing of trauma. Teachers who are trauma-informed therefore, have the potential to positively impact the lives of trauma-affected children (Treisman, 2017). However, it is not just the teachers who can help here, all school staff (who have a TIP understanding) can be agents of change in a trauma-affected child’s life. Alexander (2019) writes that bus drivers, canteen workers, school secretaries, and volunteers, along with anyone else who interacts with students and parents, should receive training in developing a relationship-based culture in the healing of trauma-affected children. This does not require the teacher or other staff to spend an inordinate amount of time in a one-on-one relationship with a child, as this would not be possible nor helpful and it could lead to dependency. Instead, the teachers and other staff can learn how to be the providers of ‘droplets’ of positive relational interactions all through the school day. This may consist simply of a high five in the corridor, or a warm smile to the child on arrival at school.

Without this kind of ‘relational safety’, a child cannot learn in school (Perry, 1999), because in a school situation, when children experience a lack of relational safety in their interactions with their teachers and/or their peers, their brains are forced to focus on protecting themselves from such things as criticism, derision, punishment and so on (Sorrels 2015).

However, while the brain's stress response system is involved with the issue of safety, the cortex is not open for learning (Perry & Graner, 2018). In this situation, children's ability to concentrate and learn is seriously compromised. Therefore, relational safety is fundamental to the learning process (Perry & Graner, (2018).

### ***2.7.3 A strengths-based approach***

With regard to viewing trauma-informed practice as a strengths-based approach, Brunzell & Norrish (2021) claim that trauma-informed approaches can be greatly enhanced by identifying, and building on students' strengths (Brunzell & Norrish, 2021). To identify and celebrate a child's strengths educators must use their observation skills to determine what a child does well, what are their talents, and what makes this particular child happy. This view concurs with that of Cole and colleagues (2005) who state that all children have an area of strength in which they excel whether that is in sports, music, art, or academics. They claim that when educators can identify and focus on children's strengths, they give them an opportunity to experience success, with all the attendant implications for their self-esteem, especially when they are seen by their peers, to be capable of doing something well (Cole et al., 2005). Cole and colleagues further indicate that building a non-academic relationship with a child is one of the most effective ways for teachers to help trauma-affected children because when children feel appreciated and cared for by a teacher, their sense of safety is enhanced, and they consequently become more open to learning (Cole et al.,2005).

### ***2.7.4 An approach that promotes safety, collaboration, and empowerment***

With regard to TIP and the promotion of safety, Jennings states "It's hard to focus on learning when you don't feel safe" (Jennings, 2019, p. 64), and she argues that 'safety' should be the first priority in building a trauma sensitive school. This view is in keeping with that of

Herman, 1997, who pointed out that “traumatic events destroy the victim’s fundamental assumptions about the safety of the world” (Herman, 1997, p. 51). Therefore, the promotion of physical and psychological safety as recommended by SAMSHA (2014) should be a first priority in any attempt to create a trauma-informed environment. Wright (2023) recognising that many adversities “are simply part of the human experience” states that realistically “sometimes the best and most important thing that we can do is ensure that our classrooms become a haven in the midst of life’s challenges, allowing our children and families to experience safety and security when things may feel less so elsewhere” (Wright, 2023, p. 147).

With regard to collaboration, a ‘TIP in education’ approach recognises that healing happens when power and decision making are shared, and therefore, that these collaborations must try to minimise power-differentials. For collaborations to be healing there must be no element of threat and so there should be a “levelling of power differences” (SAMSHA, 2014, p.11). All parties in the collaboration should be given equal respect, even if they are mixed age groups.

With regard to empowerment, a ‘TIP in education’ approach recognises that children who have been exposed to trauma have been disempowered. According to Treisman (2017) traumatic experiences strip children of their agency, power, and sense of control. For example, it is common for many children who have experienced over-controlling and coercive caregivers, to be left feeling completely disempowered (Treisman, 2017). They often feel a strong sense that they have no say over their own lives and are often resigned to living a life of subservience to others. A TIP in education approach can provide children with a sense of empowerment by actively listening to their views and giving them the power to make decisions such as what activity they wish to do and for how long, and if they wish to engage in the activity by themselves or in collaboration with another child. In addition, empowerment comes through developing skills, and becoming aware of our own abilities. Therefore, teachers can empower

children by helping them to gain skills, which others can see and perhaps praise, giving the child a sense of self-worth and self-esteem all of which build a child's sense of empowerment.

### **2.7.5 *A whole-school approach***

Lastly, existing evidence from the TIP literature highlights the need for a 'whole-school' approach to ensure that a trauma-informed 'culture' can be developed and maintained throughout the school (Cole et al., 2013). Thus, every member of the school staff needs to work together to implement "universal strategies" that foster safety, connection, regulation and learning for all students (Alexander, 2019, p. 117). Alexander explains that all staff must be on the same page, meaning, they must understand what trauma is, how it affects the social, emotional, and cognitive functioning of children; the factors in a school environment that might be 'triggering' for a trauma-experience child; and how these triggers might affect a child's behaviour. She explains that all school staff need to understand the power of relationships to bring healing and that "relationships come first" (p. 123). Like other authors, (e.g., Ludy-Dobson & Perry, 2010, Treisman, 2017) she argues that even short doses of positive relational interactions can be healing for a child and that all staff should know this and understand how important and how valuable every member of the school staff can be in the recovery of a child who has been exposed to trauma. As stated earlier, Brunzell and Norrish (2021) emphasise that all staff need to understand that every human being has strengths and that we must promote those strengths in our efforts to bring healing to children who have been exposed to trauma. In summary, Alexander (2019) states that everyone on a trauma-informed school's staff should understand the importance of: physical and psychological safety; collaboration; and empowerment; for children who have been exposed to trauma. She argues that staff at all levels should be encouraged to look for ways to help children to collaborate with adults and with their peers, and that every member of staff needs to understand the importance of empowering

children who have been made subservient by their experience of trauma. All of these concepts were used to inform the current research.

### ***2.7.6 Current Criticisms of Trauma-informed Practice***

It is important to note that the ‘TIP in education’ approach is not without its critics. For example, a number of authors have argued that the concept of trauma-informed care and practice cannot justifiably be separated from issues such as socio-economic status (SES), the social determinants of health, discrimination, racism, and other forms of social oppression (Gherardi et al., 2020; Henfield, 2019). For example, Henfield (2019) states that “It feels dishonest and disingenuous for conversations about trauma and trauma-informed care to occur without considering how racism and other forms of social oppression pervade social systems and institutions” (Henfield, 2010, p. 1). Overall, however, evidence from the literature largely supports trauma-informed approaches (Alexander, 2019; Jennings, 2019; Brooks, 2020).

### ***2.7.7 Self-care for educators as an essential element of TIP***

It is also important to note that educators themselves can be vulnerable to what is described as ‘secondary trauma’. This occurs when adults who are working with trauma-affected children start to exhibit signs and symptoms similar to those who directly experienced the trauma (Perry, 2014). This is more common when teachers have had their own personal experience of trauma, and when teachers feel that they have very few resources or the capacity to help these children (Craig, 2016). The impact on a teacher’s personal life may be evident through: changes in sleep habits, fatigue, reduced energy, irritability, feelings of sadness, inability to concentrate, desire to withdraw from others, and physical aches and pains such as stomach upsets (Alexander, 2019). The professional impact may present as: lack of motivation, decreased confidence, isolation from colleagues, overworking, absenteeism (Alexander, 2019).

*A dysregulated adult cannot help a dysregulated child.* Perry and Szalavitz (2006/2017) explain that human beings are relational creatures, and we are ‘contagious’ to the mood, the feelings, and the behaviours of other people. Additionally, we are particularly impacted by the moods and feelings of people who are, at a particular point in time, dominant in our lives. It follows therefore, that teachers, and the emotions they experience, will significantly influence the emotions of a child. Thus, if educators wish to help a dysregulated child to become regulated, they should remember that first of all, they need to be regulated themselves (Perry & Graner, 2018). Teachers need to remember to take care of themselves and to always keep in the forefront of their minds the understanding that if they are not calm and regulated themselves, they are not going to be effective in supporting dysregulated children.

***Suggestions for self-care.*** Jennings (2019) recommends that educators should create a self-care plan that addresses all aspects of their health and well-being and therefore includes their physical, emotional, intellectual, and spiritual well-being. Suggestions for physical self-care include developing healthy sleep, diet, and exercise regimes. For emotional self-care, it is recommended that educators make time to do things they enjoy, which may include engaging in sporting activities, watching movies, singing, dancing, movement classes, playing a musical instrument, or chatting with a trusted friend. Similarly, for psychological self-care, it is often recommended that educators take up a non-work-related hobby, try not to work outside of scheduled work hours, and try to make time for relaxation especially with friends and family. For spiritual self-care, often practices such as meditation are recommended, spending time in nature, and joining faith-based communities. For relational self-care, it is recommended that educators avoid spending time in the presence of negative people and that they prioritise spending time with positive people and attend pleasurable events with friends or family.

***Professional Supervision for educators.*** Interestingly, according to Venet (2021) school leaders should “*make teacher wellness a school-wide priority rather than leaving it up*

*to individual teachers to self-care their way out of it*” (Venet, 2021, p. 132). Many professions that involve the care and protection of children (e.g., social workers, and medical professionals) provide professional supervision and informal support for staff, but this is not universally the case in the field of education. For instance, a relatively recent survey carried out by Barnardos in Scotland found that nearly all staff working in education said that they would welcome ‘Supervision in Education’ programmes (Barnardos, 2020). The report alludes to the many sources of stress for educators including, for example, the inclusion agenda, addressing the unmet needs of pupils and parents, dealing with vulnerable children, and in general the emotional load of working in a caring profession). One participant quoted in the report stated that “Having worked with children with adverse childhood experiences ... there have been times when I’ve had to close my classroom door and cry for the full of break time due to what’s being disclosed” (p.7). Another teacher stated “We contain a lot of emotions from children who have distressed behaviours and we need help to contain those, reflect, move on and let go. We need to know our own triggers and how they can affect our decisions – sometimes support is needed for this, and Supervision can provide that” (p.7). These are powerful statements that speak to the importance of self-care for educators and the need for appropriate and effective professional supervision and support.

## **2.8 Theoretical Underpinnings of the Current Project**

The following three theoretical frameworks provided the foundation for, and also informed, the current research: (1) Trauma theory; (2) The Neurosequential Models (the NMT and the NME); and (3) Desimone’s framework for effective professional development. The first of these highlights the overall importance of (TIP) in general, and more specifically, in educational settings. The NMT and NME provide the neuroscientific foundation for understanding Montessori’s capacity to support trauma-affected children in her early schools,

while Desimone’s work presents a useful and comprehensive framework that may be used for evaluating professional development programmes and initiatives. Each of these is described in more detail below.

### **2.8.1 Trauma theory**

Trauma theory is based on a compelling body of evidence demonstrating that exposure to adversity and trauma in childhood (i.e., when aged under 18 years) can produce toxic stress in individuals that can have detrimental effects on their future health and wellbeing (Bellis et al., 2019; NSCDC, 2020; Shonkoff et al., 2012), and can potentially result in negative impacts on emotional, social and cognitive functioning (Cole et al., 2005; Craig, 2016; Felitti et al., 1998; Perry & Szalavitz, 2017; Treisman, 2017; van der Kolk, 2014; Wolpow et al., 2016). Specifically, children’s brain development may be affected by traumatic stress such that they may have difficulty with the ability to identify and control their emotions, control impulses, make and sustain friendships, concentrate (especially in school), develop memory and verbal skills (Cole et al., 2005). These outcomes can potentially have an extremely negative impact on children’s ability to function and achieve in educational settings. Frequently, a trauma-affected child’s behaviour in school may be mistaken for defiance, or disruption, and the child may even be wrongfully mis-labelled as ‘learning disabled’ (Perry, 2001).

### **2.8.2 TIP Models**

A key consideration with TIP in education, is how to guide educators in its uptake and implementation in schools. A number of models/frameworks have been developed in this regard, including the *Healthy Environments and Response to Trauma in Schools* (HEARTS) model, developed by Dorado and colleagues (Dorado et al., 2016); *The Heart of Teaching and Learning: Compassion, resiliency, and academic success*, resource, developed by Wolpow and colleagues, (Wolpow et al., 2009); the *Helping Traumatized Children Learn* (HTCL) ‘flexible



framework' developed by Cole in collaboration with the Massachusetts Advocates for Children, (Cole et al, 2005, 2013); and the *Neurosequential Model in Education* (NME) developed by Perry & Graner (2018) ([www.neurosequential.ie](http://www.neurosequential.ie)). According to Thomas and colleagues (2019), three themes are common to all of these approaches as outlined below.

Firstly, all of these models aim to build knowledge to support teachers in their understanding of the nature and impact of trauma on the minds and bodies of children. This involves providing educators with knowledge from reports, briefs, and other relevant literature from interdisciplinary areas such as neuroscience, mental health, medicine, and public health. One area of emphasis in the available resources is the activation of the acute stress response (the “fight, flight or freeze” response) and how it may present in children’s behaviours at school.

Secondly, there is an emphasis in all models, on shifting perspectives and building emotionally healthy school cultures, which essentially means moving away from a deficit perspective wherein children’s behaviours are seen as being problematic and destructive, to a trauma-informed perspective where children’s behaviours are seen as possible survival strategies that they have had to use to survive in overwhelmingly stressful situations. This shift in perspective provides a more compassionate approach to children’s behaviours in schools.

Lastly, and as already discussed, self-care for educators is highlighted due to the possibility that educators working with trauma-affected children, can be exposed to secondary or vicarious stress, and the importance of paying specific attention to the health and well-being of teachers and other school staff as they daily engage with trauma-affected children. Despite the similarities across all of the four models, the NME was considered to be the most useful and relevant to the current research due to its strong commonalities with the Montessori Method, and therefore it provided the foundational theory for the research here as described in more detail below.

### **2.8.3 *The NMT and the NME***

The (NME) was developed by, and is based on, the work of the neuroscientist and child psychiatrist Dr. Bruce Perry ([www.neurosequential.ie](http://www.neurosequential.ie)). The model is a non-therapeutic adaption of the Neurosequential Model of Therapeutics (NMT) also developed by Perry (Perry, 2006). The NMT was first established as a purely clinical approach that incorporated key principles of neurodevelopment into the clinical problem-solving process. The NME, on the other hand is non-therapeutic and is described by Perry and colleagues as a developmentally sensitive and biologically respectful approach to learning (Perry & Graner, 2018). It may be applied universally to all children but is especially beneficial for those with developmental problems. The NME is a train-the-trainer model in which teachers (often school principals) are trained in the model and then pass that learning on to other teachers in their school or district. The goal of the training is not to turn teachers into therapists, neuroscientists, or psychologists but rather to guide them in basic child assessment in order to identify a child's primary developmental problems and then develop a rehabilitative plan that helps to reduce/alleviate any social, emotional, or behavioural difficulties (SEBD) and increase the child's ability to engage more effectively in developmentally appropriate educational activities.

### **2.8.4 *Desimone's Framework for Effective Professional Development***

Lastly, it was important to include within the current research, a theoretical framework to inform the evaluation element of the project. A number of such models exist and are briefly described in Chapter 3, Section (3.4.2). However, Desimone's (2009) framework for evaluating professional development was considered to be most useful for the current project due to its comprehensive approach and its focus on evaluating the effects of professional development on teachers. The model highlights the importance of five core features considered by Desimone to increase teacher knowledge and bring about positive change in attitudes and beliefs which may in turn lead to changes in future behaviour that ultimately enhance their professional

practice. These core features, content focus; coherence; collective participation; active learning; and duration; are briefly explicated below:

***Content focus.*** This refers to the attempt to ensure that each lecture, or discussion in the professional development programme consistently focuses on the intended subject matter.

***Coherence.*** This refers to how well each session connects with the sessions before and after them, and the extent to which the professional development is in line with national policy.

***Collective participation.*** This refers to the opportunities afforded to participants to discuss the topics being presented, and it also implies that teachers from the same school should attend together to make the participation applicable and meaningful to their own setting.

***Active learning.*** This involves providing opportunities for teachers attending the CPD sessions to engage in activities/discussions that relate to the content of the CPD programme.

***Duration.*** This refers to the period of delivery of the CPD programme and the number of hours allocated to each individual session. Desimone recommends a minimum of 20 hours to achieve optimal learning.

## **Summary**

This chapter comprised of a review of the literature on childhood trauma, the ACE Study, and trauma-informed practice both in general, and in educational settings. A thematic approach was used to examine definitions and types of trauma, differences between stress and trauma, types of stress, and the adaptive responses or survival strategies commonly referred to as hyper and hypo-arousal. The chapter also examined Perry's concept of 'state-dependent functioning,' Siegel's concept of 'a window of tolerance', Porges' 'polyvagal' theory and the PACE model designed by Hughes. The ACE study, and the key findings of the original study were then examined alongside a critical evaluation of its strengths and limitations, as well as its on-going influence in the field.

The origin of the concept of trauma-informed practice in general was then reviewed, and the four main assumptions and six key principles of trauma-informed practice were examined, followed by a review of (TIP) in educational settings (and the five essential elements therein). The chapter then focused on the important issue of self-care for educators followed by the three most common features of the most cited TIP models and in particular, the (NME), which shows strong commonalities with the Montessori approach, and which will be further discussed in Chapter 3.

The key messages arising from this literature review are that: (a) adversity and trauma are common in childhood and they can disrupt cognitive, emotional and social functioning in children, often preventing them from learning in schools, and causing them to be misunderstood and often mis-labelled; (b) ACEs are common and pervasive, and are found in all socio-economic groups; (c) TIP in education can help children by changing the teacher's perspective from a deficit lens to a trauma-informed lens, and emphasising a relationship and strengths-based approach, which promotes safety, collaboration and empowerment, (d) self-care is vital for educators, and (e) while several TIP models are relevant to this project, the Neurosequential Model in Education (NME) is particularly applicable because it shares commonalities with the Montessori model.

Importantly, the literature review revealed that trauma research has tended to focus on contemporary approaches to healing trauma-affected children and subsequently, it became clear that there is a dearth of research investigating the extent to which historical approaches to the healing of such children might be helpful. This indicates an important gap in our knowledge which this project aims to address by investigating historical accounts of the psychological healing of trauma-affected children in Maria Montessori's early schools (1897-1917) and integrating the findings with contemporary approaches to TIP.

## **CHAPTER 3**

### **Methodology**

This chapter comprises six sections, beginning with a discussion of the ontological and epistemological assumptions underlying the research, followed by the methodological details and other considerations of each of the three studies that were undertaken as part of this research. A positionality statement is also included at the end of the chapter.

#### **3.1 Paradigmatic Assumptions: Ontology and Epistemology**

Human beings, whether we are aware of it or not, hold assumptions about the nature of reality (ontology) and how we come to know about that reality (epistemology). For researchers, these conscious or unconscious assumptions, can influence our choice of research paradigms. Basically, and in the simplest of terms, research paradigms fall under one of three camps – Positivism, Interpretivism, or Pragmatism. For example, if we believe that in this world, there is a single, universal social reality ‘out there’ that is objective, follows universal ‘laws’, is observable, measurable, independent of the researcher, and can be studied objectively without that study being in any way influenced by the researcher, then, as researchers, we are most likely to adopt the positivist approach. This will lead to the use of solely quantitative methods such as surveys and questionnaires (Thomas, 2017).

If, on the other hand, we believe that in this world, social reality is subjective and “is not straightforwardly perceivable because it is constructed by each of us in a different way” (Thomas, 2017, p. 110), and that truth and falsehood are relative concepts which are open to interpretation, then we are most likely to adopt the interpretivist approach to research. This

approach recognises that the role of the researcher is not an objective one and as Thomas explains, the researcher should instead use their “own interests and understandings” to help interpret the “expressed views and behaviour of others” and understand them as “an insider” (Thomas, 2017, p. 110). This stance will most likely lead the researcher to the use of solely qualitative methods that involve gathering in-depth, rich data involving thick descriptions (Geertz, 1973) of people’s accounts of their experiences, including their perceptions, thoughts, and reflections around these experiences, often gathered using one-to-one interviews and focus groups. It also takes account of the researcher’s awareness of their own positionality (social background, likes and dislikes, political affiliations, class, gender, and ethnicity) and how this can affect their research.

Alternatively, if researchers hold a world view, which emphasises the practical consequences and applications of ideas as the critical components of their truth and value, they are most likely to adopt the Pragmatist approach. (key thinkers in this tradition include Charles Sanders Pearce, William James, and John Dewey). Pragmatists reject the idea of objective truth because they believe that truth is made in the course of human experiences, and they hold that any form of knowledge, belief or scientific concept becomes true through its successful application in a real-world context, and always with practical consequences. According to Powell (2001), the goal of scientific enquiry, from a pragmatists’ perspective, is “not to find truth or reality, the existence of which are perpetually in dispute, but to facilitate human problem-solving” (p. 884). Thus, this approach gives priority to answering the research questions rather than engaging in philosophical discussions, and a mixed methods approach may be chosen whereby both quantitative and qualitative methods are typically used, although the focus remains on practical utility regardless of the methodology.

### 3.2 Pragmatism as a Research Paradigm.

In terms of research, the pragmatic approach has been described as one that is oriented to solving practical problems in the real world (Cohen et al., 2018). Indeed, Cohen and colleagues (2018) describe it as an approach that is predominantly concerned with practical consequences and outcomes, and an approach that “gets straight down to the business of judging research by whether it has found out what the researcher wants to know, regardless of whether the data and methodologies are quantitative or qualitative” (p. 36). It therefore could be described as an approach that is less idealistic and more practical, and fundamentally “practice-driven” (Denscombe, 2008, p. 280). According to Cresswell & Cresswell (2018) pragmatism as a paradigm or worldview arises out of real situations, actions, and consequences. They say it is concerned with “what works” – and “solutions to problems” (p.10) and that instead of focusing on methods, pragmatic researchers tend to place their focus on the research problem and the questions, and they use whatever approach is available in order to gain an understanding of the problem. However, as Cohen and colleagues (2018) crucially point out “Pragmatism is not an ‘anything goes’, sloppy, unprincipled approach; it has its own standards of rigour, and these are that the research must answer the research questions and ‘deliver’ useful, practicable reliable and valid answers to questions put by the research” (p. 36).

It was expedient therefore for this research project to subscribe to the principles of *Pragmatism* as the paradigm or worldview driving its methodology, because firstly, *Pragmatism* is a philosophical position that emphasises the facilitation of human problem-solving, secondly, it focuses on the research questions, thirdly, it uses whatever research methods are available to gain an understanding of the problem. All of these factors made it an ideal paradigm for the current research which is concerned with finding solutions to the ongoing and widespread, human problem of childhood trauma and its frequently devastating effects on children.

### 3.3 Study 1: A Documentary Analysis

#### 3.3.1 Rationale

The aim of Study 1 was to investigate the extent to which historical evidence supports the claims that Montessori schools provided a psychologically healing environment. Drawing on the pragmatist paradigm, (which, as just stated, places an emphasis on answering the research question(s), documentary analysis was chosen as it was deemed to be the optimal approach to address the first research question (i.e., *What is the historical evidence supporting the claims that Montessori offered a healing environment?*). As detailed later in Chapter 4, this involved examining archival sources relating to the original learning environments, pedagogical approaches, interactional styles, behavioural changes in children, curriculum, policies, and procedures of the early Montessori schools (circa 1907-1917) to determine the extent to which they provided ‘evidence’ of psychological healing in the children. Specifically, this approach was useful in facilitating the examination of the following key sources of historical information: (1) eyewitness accounts describing the children and the daily procedures in Montessori’s early schools; (2) media reports describing the indoor and outdoor environments at Montessori’s early schools; and (3) Montessori’s own accounts of her early schools.

Documentary analysis is defined by Bowen as a “systematic procedure for reviewing or evaluating documents ... in order to elicit meaning, gain understanding, and develop empirical knowledge” (Bowen, 2009, p. 27). He highlights that documents may take a variety of forms which include books, diaries, journals, brochures, letters, newspapers, reports, articles, press releases, and other literature, as documentary material for research purposes. In Study 1, most of these types of documents were examined, (see Table 1). Bowen explains that the analytical process involves finding, appraising, and synthesising selected data contained in the documents which may take the form of quotations, excerpts, or whole passages (Bowen, 2009).



These then have to be organised into categories and themes through content analysis. While providing a rationale for documentary analysis, Bowen states that “it may simply be the only viable source,” in historical research (p. 29). This was true of the present study.

Documentary analysis was considered to be ideally suited to the present study for the reasons outlined by Bowen (2009), and particularly in view of the fact that the main protagonists in this research are now all deceased, and therefore could not be interviewed. Firstly, it offered a time and *cost-efficient* method of gathering information because it requires only data selection rather than data collection. Secondly, many documents are now widely *available* and in the public domain (or through open access). For example, historical documents relating to Montessori’s early schools have now become more easily accessible than in previous years, and several of the sources used were either in the public domain, or were accessible through libraries or publishers. While it took time to obtain some books and articles, these were eventually located. Thirdly, documents may be described as *non-reactive*, or unaffected by the research process and therefore not subject to researcher bias or subjectivity. Lastly, Bowen describes documents as characterised by *stability* (i.e., the researcher’s presence does not alter what is being studied), *exactness* (i.e., because exact names, references and details of events are often included), and broad *coverage* (i.e., documents have the capacity to cover a long time period). Indeed, exact names, references and details of the schools observed, and for how long they were observed, were frequently included in the literature examined as part of this study (see especially White, 1914).

With regard to the limitations of documentary analysis, Bowen suggests that documents: (1) often provide *insufficient detail* to address a research question, because they were produced for some other purpose; (2) may have *low retrievability* i.e., access to documents may be blocked; and (3) there may be *biased selectivity*, reflected in an incomplete collection of documents.

### 3.3.2 Analytical Approach

This next section provides a detailed account of the categories of documents utilised in Study 1 and the steps involved in the documentary analysis (which followed RTA, Braun & Clarke, 2022). It is important to note here that, in order to mitigate against the risk of *biased selectivity* (Bowen, 2009), a variety of different types of sources were used, including: (1) eyewitness accounts; (2) media reports; and (3) Montessori’s own accounts of her early schools (please see Table 1). This added rigour to the exercise whilst also providing ‘triangulation’ of the findings from three different sources.

#### Stage 1.

The first stage was to create a list of three categories of authors who suggested that Montessori early schools offered a positive ‘healing’ environment. These categories of authors consisted of – (1) independent eyewitnesses; (2) media reporters; and (3) Maria Montessori herself. Table 1 below lists these authors. References for these authors are listed in Appendix A.

**Table 1**

*Sources referring to the ‘healing’ aspects of Montessori’s early schools. (Three categories)*

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#### Data Category 1: Independent Eyewitnesses (in chronological order)

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<i>Author and date</i>	<i>Title of document</i>	<i>Type of document (no. of pages)</i>
Fisher, D.C. (1912)	<i>A Montessori Mother</i>	Book (240)
George, A. E. (1912)	Dr. Montessori: The Achievement and Personality of an Italian Woman whose discovery is Revolutionizing Educational Methods	Magazine Article (6)

Stevens, E. Y. (1912)	The Montessori Method and the American Kindergarten	Magazine Article (6)
Marguiles, R. (1913)	Dr. Montessori and Her Method	Journal Article (7)
White, J. (1914)	<i>Montessori Schools as Seen in the Early Summer of 1913</i>	Book (185)
Bailey, C. (1915)	<i>Montessori Children</i>	Book (117)
Cromwell, M. (1916)	The Montessori Method: Adapted to the Little French and Belgian Refugees	Pamphlet (3)

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**Data Category 2: Media Reports (in chronological order)**

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Tozier, J. (1911)	An Educational Wonder-Worker: The Methods of Maria Montessori	Magazine Article (17)
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**Data Category 3: Dr. Montessori's own Accounts of her schools (in chronological order)**

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Montessori, M. (1912)	<i>The Montessori Method</i>	Book (277)
Montessori, M. (1915)	Articles from the <i>San Francisco Call and Post</i> (California Lectures)	Newspaper Articles (82)
Montessori, M. (1936)	<i>The Secret of Childhood</i>	Book (239)
Montessori, M. (1917)	The White Cross	Pamphlet (5)

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## Stage 2.

The second stage of the analysis involved developing a list of questions that would be helpful when reviewing the documents including, for example, the type of document, its intended audience, the author's social status, and date of publication (see **Table 2**).

**Table 2**

*Questions used when reviewing documents*

**Question 1. What is the document?**

Is it a book, an article, a pamphlet, or some other form of communication?

**Question 2. Who was the document intended for?**

Was it for parents, teachers, policy makers, or other target audience?

Was it written for public or private use?

**Question 3. Was the document published?**

If yes, who published it?

Was it disseminated widely, or not?

**Question 4. When was the document written?**

Were there any significant events happening at the time the document was being written that might have influenced the content or the tone of the document?

**Question 5. Who wrote the document?**

What was their profession, social network, status?

Were they affiliated to any movements (political, social, or otherwise) that might have influenced what they wrote?

**Question 6. Why was the document written?**

What was the purpose of writing the document?

Did the author stand to gain from writing it?

**Question 7. What was the impact of the document?**

What was the reported/perceived impact of the document?

### Stage 3

The third stage was to gather relevant data from each of the documents and apply Braun and Clarke's Reflexive Thematic Analysis (RTA) (Braun & Clarke, 2022) to analyse the data and identify themes. This involved six steps, including firstly, familiarisation with the data. This involved reading and re-reading the literature listed in Table 1 in order to become familiar with the data, and to take note of any recurring features and any initial thoughts that occurred in relation to how the data should be coded. The second step involved manually extracting pieces of text and highlighting them with different colors to create initial codes or meaningful labels that could be used to identify recurring ideas in the data set. For example, when reading and re-reading Montessori's specific descriptions of trauma-affected children from Data Category 3, several pieces of text were extracted, and from these pieces of text, initial codes were created e.g., "war", "trauma", "physical wounds", "psychological wounds", "human degeneration" (see **Table 3**).

The third step involved identifying potential themes. In this respect, a deductive approach was adopted because the choice of potential themes was influenced by the researcher's existing knowledge. This third step involved grouping some of the codes into broader themes. For example, from these initial codes, the following potential themes were identified - *Montessori's involvement with trauma-affected children; Montessori's concerns for trauma-affected children's mental and physical health; Montessori's desire to create trauma courses to support the work of teachers and nurses* (see Table 3). The fourth step involved reviewing the potential themes against the data to check whether these were still relevant, useful, and distinct enough from other potential themes to stand alone. The fifth step involved labelling the potential themes in meaningful ways. For example, one of the potential themes described above became the single final theme – "Montessori's proposal for an

intensive, trauma-informed course”. The sixth step involved the write up of the findings (into the article presented in Chapter 4) using the themes as the structure.

### **Table 3**

#### *Stages in the RTA*

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#### **Data Group 1: Data from Category 1: Independent Eyewitnesses**

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##### **Initial Codes:**

- repetition
- rhythm
- mindfulness exercises -effects
- practical life exercises - effects
- sensorial exercises – effects
- cultural exercises – effects

##### **Potential Themes:**

- the use of repetitive, rhythmic activities to calm children
  - the avoidance of mental strain
- 

#### **Data Group 2: Data from Category 2: Media reports**

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##### **Initial Codes:**

- no correcting
- no rewards
- no punishments

##### **Potential Themes:**

- Montessori’s deliberate and intentional efforts to prevent mental strain in children
  - Montessori’s deliberate and intentional efforts to prevent re-traumatisation
- 

#### **Data Group 3: Data from Category 3: Dr. Montessori’s own accounts**

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##### **Initial Codes:**

- repetition of the exercise promotes calm and regulation
- regulation leads to ability to relate
- regulation followed by relational opportunities promotes cortical engagement

**Potential Themes:**

- The importance of repetition in the facilitation of psychological healing
- The importance of positive relationships in the facilitation of psychological healing

**Further Initial Codes:**

- war
- trauma
- physical wounds
- psychological wounds

**Further Potential Themes:**

- Montessori's involvement with trauma-affected children
  - Montessori's concerns for trauma-affected children's mental and physical health
  - Montessori's desire to create trauma courses to support the work of teachers/nurses
- 

**Final Themes:** The final themes arrived at (drawn from all three categories) were:

- (a) Montessori's long involvement with childhood adversity and trauma
  - (b) How the Montessori method facilitated healing from the effects of adversity and trauma
  - (c) Montessori's proposal for an intensive, trauma-informed course for teachers and nurses
- 

### ***3.3.3 Adherence to the Principles of Pragmatism***

One of the key principles of Pragmatism is, that for a concept to be deemed true, it must not only be verifiable, but it also must be useful and helpful in life. Therefore, Braun and Clarke's RTA was also used to extract and code evidence from the three different data categories of positive, observable behaviours in children that demonstrate that the Montessori approach was seen to be both useful and helpful to children in Montessori's early schools (see **Table 4**) below. The behaviours listed in these three data categories, were all considered by the researcher to be "helpful in life's practical struggles" (James, 1897, lecture II), and therefore the concept that Montessori's early schools were "healing" environments adheres to the principles of Pragmatism.

**Table 4**

*Evidence (from three different data categories) of positive, observable behaviours in children suggesting that the Montessori approach was both 'useful' and 'helpful' in the early schools.*

<b>Data Category 1: Independent eyewitnesses</b>	<b>Positive observable behaviours</b>
Chronological order	The children became: -
Fisher (1912)	<ul style="list-style-type: none"> <li>• joyful, peaceful, sociable, academic, self-directed, intrinsically motivated.</li> </ul>
George (1912)	<ul style="list-style-type: none"> <li>• tranquil, polite, happy, academic, kind, gentle, sociable, peaceful.</li> </ul>
Stevens (1912)	<ul style="list-style-type: none"> <li>• academically advanced, self-disciplined, nervous systems protected from strain</li> </ul>
Marguiles (1913)	<ul style="list-style-type: none"> <li>• active learners not passive recipients, happy, busy with self-chosen tasks.</li> </ul>
White (1913)	<ul style="list-style-type: none"> <li>• non-belligerent, gentle, industrious, sociable, kind, practical, self-disciplined.</li> </ul>
Bailey (1915)	<ul style="list-style-type: none"> <li>• kind, considerate, sociable, self-motivated academic, practical, confident, happy.</li> </ul>
Cromwell (1916)	<ul style="list-style-type: none"> <li>• less anxious, calm, academically advanced, happy, peaceful, industrious, helpful.</li> </ul>
<b>Data Category 2: Media Reports</b>	<b>Positive observable behaviours</b>
	The children learned to:
Tozier (1911)	<ul style="list-style-type: none"> <li>• write without mental strain</li> <li>• read without mental strain</li> <li>• numerate without mental strain</li> <li>• do practical tasks</li> <li>• advanced academic standards</li> <li>• calm and regulate themselves</li> </ul>
<b>Data Category 3: Montessori's accounts</b>	<b>Positive observable behaviours</b>
	The children became: -



Montessori (1912), (1915), (1936).

- happy (smiled/laughed/played)
  - calm/tranquil
  - sociable (engaged with others)
  - industrious (always working)
  - academic
  - kind, non-belligerent, co-operative
  - self-motivated
  - joyful
- 

### 3.3.4 *Ethical Considerations in Study 1.*

In Study 1 ethical considerations centered around such matters as (i) the appropriate interpretation of documents written by people who are no longer around to correct any misinterpretations; (ii) the motivations of the authors of these documents - whether or not they had anything to gain by writing them; and (iii) the use of words or language in the documents that would now be considered derogatory or demeaning.

The researcher addressed these issues as follows. Firstly, the use of quotations rather than paraphrasing was consistently adopted by the researcher to maintain the precision and veracity of the content in the documents. Secondly, regarding the motivations of authors of documents, biographical information on each author of a document included in the analysis, was gathered, and scrutinised. If an author received remuneration for any documents they wrote, this was noted. For example, in the article in Chapter 4, it was clear that Josephine Tozier, who wrote a series of articles in *McClure's Magazine* from 1911, onwards (and which were key in launching the Montessori movement in America), was a journalist and was therefore paid for writing these articles. Thirdly, regarding the use of words or language in the documents that would now be considered derogatory or demeaning, in both Study 1 and Study 2, it was necessary to replace words used by Montessori and her colleagues, which were perfectly acceptable in their day, but which would now be regarded as derogatory and offensive, (especially when referring to children with intellectual disabilities). For example,

the researcher decided to use the phrase “children with mental health difficulties” to replace historical phrases such as “mentally disturbed children” (Montessori, 1964).

With ethical issues addressed, and the claims to Montessori’s early schools as healing environments now verified through documentary analysis, (see Chapter 4), the aim of the next study was to explore the extent to which aspects of the historical Montessori approach and contemporary trauma theory could be amalgamated and integrated to develop an effective and useful CPD programme.

### **3.4 Study 2: The Integration of Montessori and Contemporary Models**

As outlined earlier in Chapter 1, Study 2 was undertaken to address the second research question in this project (i.e., “*Can historical and contemporary evidence be appraised and integrated to help inform the development of a new CPD programme of Montessori-attuned, trauma informed practice?*”) Drawing on pragmatist criteria which emphasises a need to answer the research question in a way that leads to or informs useful solutions to human problems, two steps were taken. Firstly, the Montessori Method had to be compared to contemporary trauma-informed theory and practice to determine if historical and contemporary evidence in relation to trauma-informed practice could be integrated. Secondly, an appropriate framework had to be selected which would offer some useful guiding principles for the design and development of a robust CPD programme. Each of these steps is described below.

#### ***3.4.1 Comparison of the Montessori Model with Contemporary Trauma-Informed Models.***

As described earlier in Chapter 2, several highly regarded trauma-informed practice models have been developed to date, including for example, the “Healthy Environments and Response to Trauma in Schools” HEARTS programme (Dorado et al., 2016); the Helping Traumatized Children Learn HTCL programme (Cole et al., 2005/2013); and the

Neurosequential Model in Education (NME) programme (Perry & Graner, 2018). The first of these programmes promotes school success for trauma-affected students through a whole-school approach using a multi-level prevention and intervention programme, while the second focuses on policy and practice issues related to the creation of more trauma-sensitive environments within school settings.

The NME was selected as the best fit for this element of the research, mainly because this model is described by its developers as representing a biologically respectful and developmentally sensitive approach to development and learning. The Montessori model (as stated in Chapter 5) was also, from its inception, recognised by respected specialists in education, as an approach to human development and learning that is biologically respectful because, as Stevens (1913) stated, it is “based on true biological ... laws” (Stevens, 1913, p. 19). Similar to the NME, it emphasises the roles of nature and nurture, sequential brain development (over four stages or planes), and sensitive periods in development (Montessori, 1936; 1971). The NME therefore, stands out above other models which do not make such claims. Additionally, in the course of conducting the literature review included in Chapter 2, it became clear that the NME has several specific features that align with, as well as many broad commonalities shared with, the Montessori model (see Tables 5 and 6) below.

**Table 5**

Alignments between the NME and the Montessori model

<b>The NME Model</b>	<b>The Montessori Model</b>
Emphasises	Emphasises
<ul style="list-style-type: none"> <li>• Regulate through ‘patterned, repetitive rhythmic activities’ (Perry, 2009).</li> <li>• Relate Through ‘positive relational interactions’ (Ludy-Dobson, 2010).</li> </ul>	<ul style="list-style-type: none"> <li>• Regulation is promoted through rhythmic and repetitive practical life, cultural and sensorial exercises.</li> <li>• Relationships</li> </ul>

<ul style="list-style-type: none"> <li>• Reason Through adherence to this Sequence of Engagement (Perry &amp; Graner, 2018).</li> </ul>	<p>are promoted through mixed age groups, peer teaching, and an emotionally attuned teacher.</p> <ul style="list-style-type: none"> <li>• Reason i.e., cortical engagement is promoted through the incorporation of TIP principles which reduce fear and promote collaboration and empowerment.</li> </ul>
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**Table 6**

Commonalities between the NME and the Montessori model

<b>The NME Model</b>	<b>The Montessori Model</b>
Educational settings should be:	Emphasises
<ul style="list-style-type: none"> <li>• <b>Relational</b> Promoting a sense of kinship and safety (Perry &amp; Szalavitz, 2017).</li> <li>• <b>Rhythmic</b> Align with neural patterns (Perry, 2009).</li> <li>• <b>Repetitive</b> Having repeated patterns (Perry &amp; Graner, 2018).</li> <li>• <b>Relevant</b> Developmentally matched to the child. (i.e., chronological age may not match developmental age).</li> <li>• <b>Rewarding</b> Activities should be enjoyable and allow the possibility of success.</li> <li>• <b>Respectful</b> Of the children, their families, and cultures.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Positive relationships</b> (Montessori, 1913;1936; 1964;1967).</li> <li>• <b>Rhythmic activities</b> These are promoted through practical life, cultural and sensorial exercises (Bailey, 1915).</li> <li>• <b>Repetition</b> Is facilitated and children are not interrupted (Montessori, 1936).</li> <li>• <b>Relevant</b> Freedom of choice allows children to select activities that match their stage of development (Montessori, 1964).</li> <li>• <b>Rewarding</b> Exercises and activities must provide the possibility of success (Montessori, 1964).</li> <li>• <b>Respectful</b> Respect is a priority in Montessori schools.</li> </ul>

### **3.4.2 *The Desimone (2009) Framework***

In order to address the second part of Research Question 2, it was necessary to identify a framework that would help to inform the development of a robust CPD programme. The work of Boylan and colleagues (2018) provided a useful basis in this regard; these authors analysed and critiqued five significant, contemporary, analytical models of professional development for teachers/educators developed by Guskey, (2002); Desimone, 2009; Clarke and Hollingsworth, 2002; Opfer and Pedder, 2011; and Evans, 2014; respectively. Four of these models have been widely cited, although, the newer model, (Evans 2014), has not (understandably) received as many citations as the older models. The authors, identified a number of similarities and differences across these models, as well as some benefits and limitations.

For example, they describe the elements of Guskey's model as having a focus on changes in teachers classroom practices, leading to changes in student learning outcomes, which in turn, promote changes in teachers' beliefs and attitudes (p. 9). Similarly, they describe the five core features of professional development in Desimone's model, as leading to increased teacher knowledge and skills, as well as changes in teachers' attitudes and beliefs, which ultimately lead to improvements in student learning. Clarke and Hollingsworth's model is described as useful in terms of facilitating a better understanding of teacher learning and professional development. Conversely, Opfer and Pedder's model, is considered to be heavily theoretical, and aims to model the complexity of professional learning processes. Lastly, the model developed by Evans appears to be better suited to those who lead or co-ordinate teacher CPD in schools, and who want to highlight to teachers, the multidimensional aspects of CPD.

The framework considered the most suitable for the present study, and described earlier in Chapter 2, was that developed by Desimone (2009). This is highly regarded as a solid framework for evaluating teacher professional development (Kang, et al., 2013), while its

clarity and precision make it practically, very suitable for Study 2. The application of this framework is described in more detail below.

**Content Focus.** Content focus refers to the presence (or absence) of a focus on the intended subject matter/issues (Desimone, 2009) – which, in this case were: (a) Montessori and the historical accounts of her healing schools; (b) childhood trauma and its impact and effects on children’s physical, emotional, social, and cognitive functioning; and (c) trauma-informed practice. Following Desimone’s principles, the CPD programme was designed such that Session 1, would be based on the historical content relating to Montessori’s early schools. Session 2 draws on interdisciplinary knowledge from the fields of public health, neuroscience, psychology, and education and covers the neurobiology of trauma and its effects on children’s functioning. Session 3 is based on contemporary knowledge from the most cited literature on trauma-informed practice and covers definitions and examples of: TIP; the key principles and assumptions of TIP; TIP models; and especially the NME, which, as demonstrated later in Chapters 5 and 6, shows strong alignments and commonalities with the Montessori approach. Finally, Session 4 explores how TIP principles can be incorporated into contemporary Montessori/early childhood settings. The content of the programme is summarised in Table 7.

**Coherence.** Coherence refers to how well-connected each session is to the sessions before and after them, and how they merged (or did not merge) into a unified whole. In designing the sessions, it was particularly important to ensure that there was a sense of flow between each session and especially between the preceding and subsequent sessions. Desimone also highlights the need for professional development to be consistent with national policy. Therefore, any relevant Irish education policies were highlighted as part of the programme including the Irish National Educational Psychological Services (NEPS)

documents – *Self- Regulation for Pupils: A Guide for School Staff* (NEPS, n/d), and *The Response to Stress: Information for School Staff* (NEPS, n/d) which related to the issue of ‘regulation’ in children, during and after the COVID-19 lockdown. A copy of each of these documents was given to each participant during the final session, for the purpose of ensuring coherence.

**Collective Participation.** Collective participation refers to the presence at the CPD sessions of teachers from the same school and the opportunities afforded to them to discuss/reflect on the topics being presented. Following Desimone’s principles, the programme was designed to allow for collective participation between the participants. For example, the agenda for each session, was outlined (on slides) including clear time slots during which participants would be given opportunities for group discussion on the content.

**Active Learning.** Active learning involves giving opportunities to teachers attending the CPD sessions to engage in activities that relate to the content of the CPD programme. This can take a number of forms including observing expert teachers explaining how they translate theory to practice, followed by group discussion. Following Desimone’s principles, the agenda for each session was designed in a way that included time slots in which participants would be given opportunities to demonstrate how they might translate the theories into practice.

**Duration.** Duration refers to the period of delivery of the CPD programme and the number of hours allocated to each individual session. According to Desimone, “research has not indicated an exact ‘tipping point’ for duration but shows support for activities that are spread over a semester ... and include 20 hours or more of contact time” (Desimone, 2009, p. 184). In summary, CPD programmes delivered over longer periods of time, (i.e., at least over one semester) demonstrate superior impacts, and the number of contact hours required to

achieve optimal learning is 20. The delivery of the CPD programme for this PhD project took 25 hours and was delivered over the Autumn semester with follow-up sessions and focus groups in the Spring semester. Therefore, in terms of ‘duration’ the teaching sessions adhere to Desimone’s recommendations. Following Desimone’s framework, the programme outlined in **Table 7** below, was designed, and then delivered to a test school.

**Table 7**

**The “Tipping the Scales” Programme (TSP): A Programme of Montessori-attuned, trauma-informed practice (TIP)**

<b>Overview of the programme</b>	
<b>Session 1</b>	<b>Historical approaches to TIP - Montessori</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• Brief introduction to Dr. Maria Montessori</li> <li>• Montessori’s work with trauma affected children</li> <li>• Montessori’s approach to healing trauma affected children</li> </ul>
<b>Session 2</b>	<b>Trauma</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is trauma?</li> <li>• Trauma Versus Stress</li> <li>• The Stress Response</li> <li>• Survival Strategies - hyper and hypo - arousal</li> <li>• The window of tolerance</li> <li>• The Polyvagal Theory</li> <li>• The PACE model</li> </ul>
<b>Session 3</b>	<b>Trauma Informed Practice</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is TIP</li> <li>• The 6 core principles of TIP (SAMHSA 2014)</li> <li>• The 4 main assumptions of TIP (SAMHSA 2014)</li> </ul>



<b>Session 4</b>	<b>TIP in Contemporary Montessori/Early Childhood Settings</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• How to incorporate the 6 TIP principles in Montessori/Early Childhood Settings</li> <li>• How to incorporate the TIP assumptions in Montessori/Early Childhood Settings</li> <li>• How to incorporate Montessori-Attuned TIP in Montessori/Early Childhood Settings</li> </ul>

### **3.4.3 Ethical Considerations in Study 2**

In Study 2, ethical considerations focused mainly on language issues arising from the fact that (as stated earlier), some of the historical documents examined in Study 1 contained words or language which were acceptable at the time of writing, but which would now be considered derogatory or demeaning, especially when referring to children with intellectual disabilities. Since the aim of Study 2 was to blend elements of Montessori’s historical approach to supporting trauma-affected children, with contemporary approaches, it was necessary to replace some of these words with terms that are now more socially acceptable (e.g., ‘mental health difficulties’).

### **3.5 Study 3: A Case Study Evaluation**

The final study was conducted to address the third research question, i.e., the perceived impact/effectiveness, acceptability, and feasibility of the newly developed TIP programme and any post programme changes in teacher knowledge, attitudes, beliefs, and professional practice. Here a mainly qualitative case study design and approach was employed, alongside the use of some brief purposively designed questionnaires.

### **3.5.1 Rationale for using a Case Study Design**

A case study is “an in-depth description and analysis of a bounded system ... and the single most defining characteristic of case study research lies in ‘fencing in’ or delimiting the object of study: the case” (Merriam & Tisdell, 2016, p. 38). Thus a ‘case’ could be a single person, (i.e., who exemplifies a phenomenon of interest) a community, a programme, a group/organisation/institution, or a specific policy. They further explain that it is the ‘unit of analysis’ and not ‘the topic of investigation’, that is important in terms of providing the basis for a case study (p. 39), unlike other types of qualitative research such as ethnography, phenomenology, narrative, and so on. Furthermore, a case study approach enables a researcher “to dig, and to dig deep” (O’Leary, 2017, p. 215), in order to properly explore and illuminate the topic under investigation.

For the above reasons, a case study approach was used in the present study to facilitate an in-depth, exploration of the experiences of the teachers who participated in the programme. This involved the use of primarily qualitative methods, but with some (limited) quantitative information also included, in order to ensure that all participants had a voice during data collection. Moreover, the findings helped to support and validate, through triangulation, the qualitative results.

### **3.5.2 Participants and Setting.**

This section provides a *thick description* (Geertz, 1973) of the participants and setting which was not possible in the article presented in (Chapter 7) due to word count constraints. The ‘unit of analysis’ in this project was a single Montessori school. The participants consisted of 11 qualified teachers (which included the manager) most working daily in the school, (all female). Nine of the participants are native Irish, while two participants are from other

European countries. The school is atypical in that some of the teachers have been there for a long time (over 20 years), and there is a very low staff turnover.

Over half of the teachers have a Montessori qualification, whilst the other teachers have varying levels of professional training in Early Childhood Education (e.g., FETAC levels 6, 7 and 8). Several staff also have training related to the care of children with additional needs. Continuing professional development (CPD) was highly regarded by staff members, and all are trained in first-aid, child protection, safeguarding, and food hygiene.

**3.5.2.1 The Setting:** The programme was delivered in the participants' workplace where they were at ease in familiar surroundings. This allowed for what O'Leary (2017), referred to as "the building of holistic understandings ... prolonged engagement and the development of rapport and trust" (O'Leary, 2015, p. 215) between the researcher and the participants. This rapport and trust were considered vital in enhancing the probability of sincere, thoughtful, and meaningful discussions in the focus groups.

The school, called 'Clever Cloggs Montessori' (name has been changed for the purpose of anonymity) is located in a suburban town in the west of Dublin in Ireland. The school is located in the older, more affluent part of the town. It is a populous area but is well served having plenty of amenities such as shops and schools. Families living in the area have a mixed socio-economic status ranging from well-off to unemployed. The school is a Montessori preschool and creche which offers full day care for children from 2 ½ to 5 years, and out of school care to children from 4 to 12 years. It is open 51 weeks a year, from 7:30 am to 6 pm, closing only for public holidays. All meals are provided, along with homework support, games, and recreational activities. The school is located in a large purpose-built single-storey house extension, which has an attractive landscaped front entrance, with hanging baskets of flowers attached to walls and plants arranged around the pathway leading to the door. There is ample

parking for staff cars to the left of the entrance, and (for safety reasons), at a distance from the entrance pathway used by parents and children. To the right of the entrance door, there is also ample car parking for parents delivering and collecting children. The front door (which uses a code for entry), opens onto a large and very wide hallway which is used for storage of large outdoor toys such as bikes, ride-on cars, wheelbarrows, and other outdoor equipment such as basketball nets, tennis rackets, football posts etc. This very wide hallway/storage area leads via a locked door to the main outdoor playground, which is filled with quality play equipment including a slide, sandpit, outdoor mud-kitchens, and a water play unit. This playground houses a wooden log cabin that is used as an office. The playground leads directly to the school entrance proper which contains four bright, and beautifully decorated classrooms, two on the left of the door and two on the right of the door each having an adjoining entrance.

Each classroom has a variety of shelves containing quality play and educational materials as well as Montessori materials on separate shelves. The classroom walls are neatly covered with the children's artwork, drawings, paintings, and crafts, and they are all dated. There are also (at the children's height) visual timetables and charts reminding children about cough hygiene and the use of handkerchiefs or tissues. To the left of the fourth classroom, there is a bathroom containing child-sized toilets and sinks, and above each sink there is a visual (photo) reminder about handwashing. The fourth classroom has its own enclosed outdoor garden so the children in that classroom have free access to the outdoors most of the day. There is a canopy to keep them dry on rainy days. The atmosphere throughout the building is friendly, warm and inviting.

The children who attend the school and their families live in the immediate locality and surrounding areas. Up to 20% of the children attending the school may have refugee status in any given year. These children and their families live in 'Direct Provision', a system of asylum seeker accommodation used in Ireland which typically involves living in one room (e.g., a hotel

room) with communal kitchen and bathroom facilities. The school therefore is multi-cultural and on an average year, for up to 20% of the children, English is not their first language.

### **3.5.3 Measures**

Details relating to measures, data analysis and findings are provided in the paper (under review) in Chapter 7, which is based on this case study. However, due to word count restraints, details relating to the questionnaires (administered to participants both before and after each session of the programme) (see Appendix C), were not included in that paper. Therefore, details of each of these Questionnaires are described below (with the findings reported in Appendices D and E). A brief summary of the primarily qualitative element of the study is also provided here.

In brief, a Topic Guide was developed, and two focus groups were held with all participants in the Spring semester, approximately three months after the delivery of the programme (in the previous Autumn semester) The development of the Topic Guide was informed by the review of the literature (see Chapter 2) and included questions around the participants' knowledge relating to trauma, TIP, and Montessori's involvement with trauma affected children. Questions relating to the participants' attitudes and beliefs around children's behaviours were also included. Additionally, participants were asked for their views on the feasibility of the programme. The focus group sessions were 90 minutes in duration. Detailed fieldnotes were also recorded by the co-facilitator during the entire process of programme start-up, delivery, and focus group sessions.

In terms of data analysis, the qualitative data were analysed using Braun and Clarke's Reflexive Thematic Analysis (Braun & Clarke, 2022). With regard to findings, five themes were identified from the analysis, and these themes are discussed in detail in the article (under review) in Chapter 7. Additionally, as stated above, because of word count constraints, details

relating to questionnaires given to participants both before and after each session of the programme (see appendix C) were not included in that article, therefore they are included here:

**3.5.3.1 Questionnaires.** Three Questionnaires (with sub-sections) were developed by the researcher for purposes of the study to quantitatively assess various aspects relevant to the perceived effectiveness and experience of the programme (see Appendix C). Each of these is described below:

**3.5.3.2 Knowledge, Attitudes, and Beliefs Questionnaire.** This comprises 12 sections in total, with 8 (sections 1a – 1h); designed specifically to assess (both before and immediately after attendance at the TSP), several aspects including: (i) knowledge of ACEs, trauma, TIP, and Montessori’s interest and expertise in mental health and childhood trauma; and 4 sections designed to assess several other aspects including: (ii) attitudes (sections 2a-2b) and (ii) beliefs (sections 3a-3b) around children’s behaviours, both before and after attendance at the programme. Typical statements were: *‘Prior to attending this course, I knew very little about Dr Montessori and her interest and expertise and mental health, and childhood trauma’*, to which a participant could circle one of five responses which (following the Likert scale) ranged from Strongly Agree, Agree, Neutral, Disagree, to Strongly Disagree. This type of statement (which focused on prior knowledge) was for the most part followed by a statement such as *‘Following attendance at this CPD course, I have learnt a great deal about Dr Montessori and her interest and expertise in mental health and childhood trauma’*.

**3.5.3.3 Professional Practice Questionnaire.** This comprised 2 sections (section 4a-4b) designed to gather data on the participants’ Professional Practice, both before and after attendance at the programme. Here typical statements included: ‘Prior to attendance of this

CPD programme I would not have viewed children through a trauma-informed lens’, and ‘Following attendance at this CPD programme, I now view children through a trauma-informed lens’.

**3.5.3.4 Programme experience Questionnaire.** This comprised 10 sections designed to gather data on the participants views on:

- (i) the perceived obstacles or supports to programme acceptance/implementation (5a-5b).
- (ii) their personal thoughts on the benefits (if any) of attending the programme (6).
- (iii) the perceived benefits of TIP (7)
- (iv) self-care for educators (8).
- (v) the programme’s adherence to Desimone’s framework (Sections 9a-9e) in terms of: *content focus; coherence; collective participation; active learning; and duration* (Desimone, 2009)

Due to the limited questionnaire data, only a descriptive analysis was conducted. The detailed findings from these questionnaires are provided in Appendix D, and a shorter summary of the findings is presented in Appendix E.

#### **3.5.4 Ethical Considerations in Study 3**

Study 3 received ethical approval from Maynooth University’s Social Research Ethics committee and was conducted in accordance with the ethical code of conduct of the Psychological Society of Ireland (PSI). Due attention was paid to the core principles of beneficence, nonmaleficence, autonomy and inclusivity and written informed consent was obtained from all participants (including consent for the focus group sessions to be audio recorded). Copies of the Information and Consent Forms are provided in Appendix B. The wellbeing of the research participants was taken into consideration at all times. During the initial stage of the research process, the researcher contacted the manager of the host school,

and had a meeting to discuss the project. Information and Consent Forms were then given to the manager to distribute to all staff to inform them about the purpose of the study, what they would be asked to do if they chose to be participants, and their right to leave the study at any time without recrimination from any source. The manager agreed to distribute the Information and Consent Forms to all staff members. Additionally, at the beginning of the first session, the researcher once again explained to participants the purpose of the study, and explained that it dealt with sensitive issues, and that their participation was entirely voluntary. It was reiterated to intending participants that they could withdraw at any time without penalty or recrimination. As the programme dealt with sensitive issues (e.g., abuse, poverty, neglect, trauma), participants were advised (in writing in the Information and Consent Form and verbally, before the first session began), that the content could trigger a psychological or emotional stress reaction. The Information and Consent Form emphasised to prospective participants the need to carefully consider the content of the programme before agreeing to participate. Participants were also told verbally by the researcher, before the sessions began, that if, in recent months, they had experienced a significant stress, adversity, or trauma, that this might not be the right time to engage in the programme.

**Key ethical considerations centred around issues such as:** (i) building rapport between the researcher and the participants, (ii) creating a safe and comfortable space for participants; (iii) considering the potential for power dynamics (between the manager, the researcher, and the participants), (iv) agreeing on comfort breaks and ‘brain breaks’; (v) dealing with sensitive topics and the delivery of trigger warnings; (vi) establishing a protocol if participants became upset or distressed; (vii) agreeing on confidentiality and its limitations.

**The researcher addressed the above issues by:** (i) using plain English in the delivery of the programme, and explaining, for example, any neuroscientific terms that would not typically be understood by persons without some knowledge of neuroscience; (ii) ensuring the



participants of confidentiality so that they knew they were in a safe space; (iii) mitigating against the possibility of power dynamics, by making it clear both verbally and in the Information and Consent Form that there would be no pressure on staff to take part in the programme. *[Details: (a) The manager stated in front of the staff and the researcher, that there would be no compulsion on any staff member to take part in the programme; (b) The researcher was aware that focus groups can create a relationship that positions the researcher and participants in a hierarchical position. However, in order to help mitigate against this risk, the researcher firstly, made it clear to the participants that their truthful opinions were valued and secondly, used a friendly tone of voice and body language to limit the extent to which participants felt the existence of a power relationship];* (iv) agreeing at the beginning of the first session, a protocol (following the participants' suggestions) in relation to comfort breaks and brain breaks; (v) agreeing at the beginning of the first session, a protocol in relation to sensitive topics and the giving of trigger warnings whenever sensitive issues were about to be discussed or viewed through any form of media (e.g., a short video clip); (vi) agreeing at the beginning of the first session, on protocol if participants became upset or distressed, and participants agreed that if they became distressed, they could go into one of the other empty classrooms, and a member of staff they felt comfortable with, would be available should they want or need them; (vii) addressing the limits on confidentiality as explained in the Information and Consent Form.

### **3.6 Positionality Statement**

The preface (pp xi-xv) of this thesis explains a little about what drew me to this research topic, but it does not fully explain my positionality. I have been a Montessori teacher of 3–6-year-old children for 30 years and am a strong believer in the potential of the Montessori approach to aid the natural and optimal development of children of any race, culture, or socio-

economic background. I have seen in my own schools, year on year, substantially positive changes emotionally, socially, and cognitively in children who were exposed to the simplicity, yet “genius” (Lillard, 2005) of the Montessori approach. However, I was aware of the possibility throughout this research that my strong belief in the effectiveness of the Montessori approach could be a source of bias, especially in the conduct of Study 3. Therefore, a number of steps were taken to try to mitigate this risk. For example, while conducting Study 3, I emphasised to the participants that no models are perfect and that as teachers, we should always reflect on our own biases and unconscious prejudices. I further highlighted that teachers and class assistants are human and therefore prone to error, and that even at the beginning of the Montessori movement, in some schools, there was often a lack of fidelity to Montessori principles, and sometimes the teachers or assistants did not meet up to Dr Montessori’s high standards.

I also shared with the participants comments from Dr Jessie White, (1865-1968) a very highly regarded English specialist in science and education who, in 1913, travelled to Italy to spend several months there visiting Montessori schools with the aim of recording and presenting the “truth unfalsified” regarding all aspects of the schools (White, 1914, p. 7). Although overall, White was very impressed with what she witnessed in the schools, she wrote that when she visited the Casa at 58 Via de Marsi (the original Casa dei Bambini directed six years earlier by Dr. Montessori herself), the young assistant to the directress showed by her behaviour that she had little idea of the principles underlining Montessori’s work, and White stated that “if she loved the children, she was successful in concealing it” and that “she gave one the impression of fierceness” (White, 1914, p. 64). I explained to the participants that, like all systems, the Montessori approach has always been vulnerable to bad practice, bias, prejudice, and discrimination, and we need to work with our eyes wide open, and not be too proud to notice our own failings.

I also shared with the participants the fact that in my early days of running a Montessori school, with no knowledge of trauma, I was often at a loss to understand the behaviours of some children. For example, I shared that on my opening day, many years ago, when one of the children suddenly vomited in the proximity of another child, causing that child to become extremely distressed and almost hysterical, I learned, (the hard way), how important it is to gather background information on children before they arrive, so as to avoid misjudging them on account of their often, inexplicable behaviours. In this case, I learned (after several hours) that the child who became extremely distressed, and whom I had (mistakenly) judged to be inordinately upset, had recently endured a traumatic experience which helped to explain their behaviour. This child had recently had to have their stomach pumped as a result of accidentally swallowing a paracetamol containing drink which the parent (with chronic migraine) had mistakenly left, for a few seconds, within the child's reach. During the admission to hospital, the child had vomited profusely, and consequently, the vomiting incident in the class had most likely acted as a trigger, bringing back distressing memories associated with this recent hospital admission. I also learned (again after several hours) that the child who was sick, had a serious and chronic stomach illness which the parents had not disclosed to me.

The lessons I learned from this incident were firstly, never make judgements about a child's behaviour until all the facts are available, and secondly, the necessity to ask parents in advance of their child's arrival at school, if their child has had "any frights or other kinds of shock" just as Dr. Montessori advised over a century ago (Montessori, 1967, p. 197). This was a humbling but vital experience for me, and it taught me early on in my career, that (a) I should always be aware that the reasons underlying children's reactions and behaviours may not always be obvious and may lie under the surface and (b) that a teacher should be alert at all times to the possibility of past traumatic experiences in a child's life.

I also discussed with the participants how Dr Montessori emphasised the importance of humility and the ‘spiritual preparation of the teacher’ (Montessori, 1936, 1967), which involved continuous soul-searching and reflective practice. I shared with the participants some of my own personal reflections on my 30 years of practice and how, early on, I developed the habit of reflexivity, so that I was continually in reflexive mode, continually asking myself if I was being biased in any way towards children or their caregivers. I also shared with participants how my habit of meeting frequently (sometimes once a week) with each parent or caregiver, helped me to build a close bond with each child’s family and enabled me to create schools wherein there was a collaborative approach, and a trusting relationship between myself and each child’s caregiver. I explained how this often resulted in parents confiding in me on issues affecting their children, which enabled me to better understand each child and their behaviours, which mitigated against the risk of misjudging them. I also discussed with the participants some suggestions from a contemporary book on Montessori pedagogy, by a seasoned practitioner, Elizabeth Slade, which I found very helpful. It encourages Montessori teachers to practice “honest talk” and squarely face up to our unconscious prejudices (Slade, 2021). These unconscious prejudices can range from judgmental views about what Montessori training organisations one’s colleagues attended, to judgmental views about parents and their parenting styles, which may be linked to their ethnicities and cultures. I discussed with the participants the problems that can arise due to these types of judgmental attitudes, especially if they are linked to issues of ethnicity or culture, and how they can expose a teacher to the risk of developing attitudes and lenses that are fundamentally racist or unhelpful (even if cloaked in altruistic intentions).

In an effort to address these risks and biases, I shared with the participants the results of a recent systematic review that shows that “Montessori education has a meaningful and positive impact on child outcomes, both academic and non-academic, relative to outcomes seen

when using traditional educational methods” (Randolph et al., 2023, p. 2). I also shared with them the fact that the authors concluded that “this Montessori result is highly significant” (p. 46) because it is an important predictor of future outcomes. In addition, I pointed out that other fairly recent studies on Montessori pedagogy continue to testify to the benefits of the Montessori approach both in childhood and adulthood (Preschlack, 2023; Lillard et al., 2021). I made it clear to the participants that my strong belief in the effectiveness of the Montessori approach has always been based on evidence as outlined in respected reports from reliable early eyewitnesses, and on robust contemporary studies such as Lillard (2005), Lillard & Else Quest (2006) and the more recent systematic study by Randolph et al., (2023).

Ultimately, my positionality could be summed up by stating overtly that I believe that the Montessori approach is even more relevant today than ever before, in the context of adversity and trauma research, and that Montessori’s methods, principles, and approaches may be usefully harnessed and employed to promote trauma-informed practice in contemporary education settings. At the same time, I recognise that this positionality has the potential to influence my research, both positively and negatively. On the positive side, as a former practitioner with many years of experience, I understand the challenges faced by Montessori teachers. For example, I understand how education policies in some countries mitigate against fidelity to core Montessori principles, making it difficult, and in some cases impossible, to reap the full benefits of the Montessori approach. One example of this would be the obstacles some Montessori teachers face when trying to implement three-hour uninterrupted ‘work’ periods for children (i.e., blocks of time when children can have self-directed engagement with the materials, without interruption). This is often disallowed in Ireland and the UK (Williams & Stephens, 2023), despite the fact that Montessori found these ‘work cycles’ helpful in promoting calm and tranquility in children and also promoting concentration and flow (Rathunde, 2023).

Conversely, a negative aspect of my positionality is that as a doctoral candidate conducting a case study (as I did in Study 3) I was aware at all times, of a potential power differential between the participants and myself. Specifically, there was the possibility that participants could feel that if I (as a PhD candidate) had a confidence in the beneficial aspects of the Montessori approach, they ought to have this confidence also. It was because of my awareness of this risk of potential bias, that I took the steps (described above) to mitigate that risk. While presenting these warnings and admonitions, I also presented my hypothesis, held for many years, that Montessori environments have the potential to bring psychological healing to children and therefore have the capacity to solve very real human problems.

## **Summary**

This chapter presented firstly the philosophical paradigm of Pragmatism which informed the conduct of all three studies on which this project was based, and which were designed to address the three research questions underpinning the research. Documentary analysis was used as a qualitative research method in Study 1; the framework for effective CPD design created by Desimone (2009) was used in Study 2; and a Case Study design was employed in Study 3. A number of key ethical considerations pertaining to all three studies were also discussed. Lastly, a positionality statement was provided. The results of all three studies are presented in the chapters that follow.

## CHAPTER 4

### The historical evidence that early Montessori schools were 'healing' environments.

#### (Study 1)

This chapter presents the paper “Montessori, the White Cross, and Trauma Informed Practice: Lessons for Contemporary Education” which has been published in the Journal of Montessori Research as cited below.

Phillips, B., O'Toole, C., McGilloway, S., Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. *Journal of Montessori Research*. Vol. 8 Issue (1). 13-28.

<https://doi.org/10.17161/jomr.v8i1.15767>

This paper is based on the findings from Study 1, a documentary analysis of Montessori 's early schools (1897-1917), which was conducted by the researcher to answer the first research question: “What is the historical evidence supporting the claims that Montessori offered a 'healing' environment?”

### **Abstract**

Childhood adversity and trauma are pervasive and have powerful, far-reaching consequences for health and well-being. Recent years have seen increased recognition of the need for trauma-informed practice, which aims to promote understanding, healing, and the prevention of retraumatization. Historical data show that the early Montessori schools were known internationally as healing schools, wherein children affected by adversity or trauma were apparently healed on a considerable scale. This study presents the findings from a documentary analysis of three primary sources, namely, Maria Montessori's own original accounts, eyewitness accounts, and media reports pertaining to this healing aspect of the early Montessori schools. The findings demonstrate that, first, from the beginning of her career, Dr. Montessori worked with children who had experienced significant exposure to adversity or trauma, second, that her Montessori Method was shown to effect healing or recovery in these children, and third, that her long involvement with trauma-affected children directly led to her later attempts to set up an organization to be called the White Cross, which was to incorporate, among other things, a trauma-informed course for teacher-nurses. In this innovative approach to Montessori studies, we argue that Dr. Montessori was ahead of her time, that her work is even more relevant today in the context of adversity and trauma research, and that her methods, principles, and approaches may be harnessed and used in ways that promote trauma-informed practice in contemporary education settings.

**Keywords:** *Montessori, the White Cross, trauma-informed, childhood adversity/trauma, education*



*Children have many kinds of sensitiveness, but they are all alike in their sensitiveness to trauma.* (Montessori, *The Absorbent Mind*, 1967, p. 131)

Maria Montessori (1870–1952) was a woman ahead of her time. In 1896 she was one of the first women in Italy to obtain a double honors degree in medicine and surgery; she was remarkable in that her doctoral thesis was based on a psychiatric topic even though psychiatry was a relatively new branch of medicine at that time (Kramer, 1976). After receiving her medical degree, Dr. Montessori furthered her research in psychiatry such that, as early as 1897, she was recognized as a knowledgeable clinical psychiatrist (Povell, 2010) and an expert in childhood mental illness (Gutek & Gutek, 2017). As Babini stated, she went on to carve out “a remarkable career: from psychiatrist to educationalist” (Babini, 2000, p. 45). In 1896, she began her career with children who suffered the double burden of being both developmentally challenged and victims of adversity and trauma (in the form of emotional and educational neglect), and she continued for the next 20 years to be involved with children who had suffered significant exposure to adversity and traumatic experiences (e.g., the children of San Lorenzo who grew up in one of the poorest slum districts in Rome; the children of Messina and Reggio Calabria who survived a devastating earthquake that left most of them orphaned and homeless; and the French and Belgian children who were exposed to the horrors of war, which left many severely traumatized; Phillips & Phillips, 2016). All of these children were exposed to what we would now call adverse childhood experiences (ACEs; Felitti et al., 1998).

*Adverse childhood experience* originally described exposure before the age of 18 to stressors such as abuse, neglect, domestic violence, parental separation, household substance misuse, and family mental health issues (Felitti et al., 1998). In more recent years, however, the importance of other adversities, such as homelessness, poverty, racism, and other inequalities, has been recognized by leading organizations such as the National Scientific

Council on the Developing Child (2020) at Harvard University. These types of experience overlap with what is considered *childhood trauma*, which refers to exposure to either single or multiple overwhelmingly stressful experiences that can leave children psychologically and biologically damaged (Burke Harris, 2019; Herman, 2015; Perry et al., 1995; Perry & Winfrey, 2021; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014; van der Kolk, 2014). A vast and compelling body of research demonstrates that traumatic experiences have a detrimental impact on brain development and cognitive, social, and emotional functioning, thereby affecting a child's ability to learn, form relationships, and function appropriately at school (Cole et al., 2005; Craig, 2016; Perry & Szalavitz, 2017; Treisman, 2017; Wolpow et al., 2016). This effect has led to increasing recognition of the need for schools and other human-service settings to become trauma informed and trauma responsive by implementing trauma-informed practice (TIP; Alexander, 2019; Jennings, 2019; Maynard et al., 2019; Overstreet & Chafouleas, 2016; Thomas et al., 2019). TIP is an approach that aims to understand the impact of trauma on an individual's life and respond in a manner that offers safety, both physical and emotional, to that individual, as well as to prevent retraumatization. It also seeks to empower people to reestablish control over their lives (SAMHSA, 2014). TIP acknowledges the prevalence of trauma, as well as the biological, social, and psychological consequences of trauma on an individual's affect and behavior (Cole et al., 2005; Wolpow et al., 2016). The key principles of trauma-informed practice are accepted as safety, trustworthiness, choice, collaboration, empowerment, and respect for diversity (Fallot & Harris, 2009).

This paper argues that the concept of trauma-informed care in the early childhood years is not necessarily a new one. For example, it is not widely known, by either teachers or the

general public, that Dr. Montessori had a strong “interest in psychological trauma in children” (Scocchera, 2002/2013, p. 49), and a long involvement with children who were exposed to adversity or trauma. We argue that her involvement with four specific groups of children—first, the “persecuted,” “neglected” and “rejected” children from the Manicomio di Roma (the psychiatric hospital of Rome, usually referred to historically and by Dr. Montessori as the asylum”; Montessori, 2008, p. 263); second, the “tearful, frightened children” of San Lorenzo (Montessori, 1936, p. 123); third, the “numbed, silent, absent- minded” children of Messina-Reggio (Montessori, 1936, p. 152); and fourth, the “psychologically or mentally mutilated” French and Belgian children (Montessori, 1917/2013, p. 39)—arguably represented significant efforts on her part to support children suffering from the effects of adversity and trauma (Kramer, 1976; Mayfield, 2006; Montessori, 1917/2013; Moretti, 2021). This involvement with trauma-affected children, combined with her attempts in 1916 and 1917 to train teachers and nurses in “special methods of education” (Montessori, 1917/2013, p. 40) to facilitate healing from psychological trauma (as part of the work of an organization she intended to call the White Cross), further represented significant efforts on her part to support children suffering the ongoing effects of trauma (Kramer, 1976; Mayfield, 2006; Montessori, 1917/2013; Moretti, 2021; Trabalzini, 2013). These vivid and explicit descriptions by Dr. Montessori herself, of children damaged by psychological trauma that subsequently led to their inability to learn, were the inspiration for our argument that Dr. Montessori’s interest in and long involvement with psychological trauma culminated in her plan to design and deliver a trauma-informed course to teachers and nurses, to enable them to understand the effects of adversity and trauma on children, and to give them the skills to help these children to heal and recover. It would appear, therefore, that Dr. Montessori’s approach to education and care was very much shaped by her interest in childhood trauma, but her contribution in this respect has not yet been fully investigated.

This paper reports the first stage of a larger, three-stage study designed to investigate the extent to which Dr. Montessori’s practices and principles may be harnessed to develop a new professional-development course designed to help teachers better understand and implement trauma-informed practice in early childhood education. The overarching aim of this three-stage study is to support children affected by trauma by introducing and scientifically testing (in stages 2 and 3 of the study) Montessori-attuned, trauma-informed practice. The specific objectives in this first stage are to explore the historical, documentary evidence to identify and critically describe Dr. Montessori’s involvement with children who had suffered psychological trauma, her descriptions of the presentation of that trauma, and her approach to healing and recovery.

### **Method**

The specific research question underpinning this study is “What is the historical evidence supporting the claims that Dr. Montessori offered a healing environment?” To answer this question, the authors conducted a qualitative documentary analysis (two authors are Montessori practitioners and researchers; one is an academic with particular expertise in school-based, trauma-informed practice; and one is a senior academic involved in mental health and the well-being of children and families), in line with the approach recommended by Bowen (2009). A total of 12 documents relating to Dr. Montessori’s work between 1898 and 1917 (i.e., eyewitness accounts, media reports, and Dr. Montessori’s own accounts) and specifically to the four specific groups of children referred to earlier were procured and scrutinized (see Table 1). These sources yielded a large amount of data, consisting of excerpts, quotations, passages, and entire books that were selected for analysis. Braun and Clarke’s analytical model (2006) was used. Specifically, the historical material was examined and categorized into

themes, and then the theoretical concepts (as outlined in the theoretical framework below) shaped the final identified themes.

### **Theoretical Framework**

This study is anchored in the concept of trauma and guidance for a trauma-informed approach adopted by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2014). Contemporary research and theory in trauma studies demonstrates the impact of exposure to adversity and traumatic events on the mind and the body (Felitti et al., 1998; van der Kolk, 2014). After exposure to chronic adversity or traumatic events, children often become either hyperaroused (i.e., reactive, aggressive, hypervigilant), hypoaroused (i.e., numb, detached, dissociated), or a mixture of both, and these states can become habitual (Perry et al., 1995). These states have a negative effect on the child's ability to learn, develop relationships, and function appropriately in schools (Cole et al., 2005). There is a need, therefore, for teachers to be aware of how exposure to adversity and trauma affects both the behavior and emotional responses of the child, and of how to prevent retraumatization and promote recovery (Craig, 2016).

### **Results**

Three major themes were identified from the analysis: (a) Dr. Montessori's long involvement with childhood adversity and trauma, (b) how the Montessori Method facilitated healing from the effects of adversity and trauma, and (c) Dr. Montessori's proposal for an intensive, trauma-informed course for teachers and nurses as part of the White Cross organization. We review each theme.

**Table 1**  
*Chronological List of Data Sources*

Author and date	Title of document	Type and length of document
M. Montessori (1936)	<i>The Secret of Childhood</i>	Book (239 pages)
M. Montessori (1917)	<i>The White Cross</i>	Pamphlet (5 pages)
M. Cromwell (1916)	<i>The Montessori Method: Adapted to the Little French and Belgian Refugees</i>	Pamphlet (3 pages)
M. Montessori (1915)	<i>Articles from the San Francisco Call and Post</i>	Newspaper articles (82 pages)
C. Bailey (1915)	<i>Montessori Children</i>	Book (117 pages)
J. White (1914)	<i>Montessori Schools as Seen in the Early Summer of 1913</i>	Book (185 pages)
R. Marguiles (1913)	<i>Dr. Montessori and Her Method</i>	Journal article (7 pages)
D. C. Fisher (1912)	<i>A Montessori Mother</i>	Book (240 pages)
M. Montessori (1912)	<i>The Montessori Method</i>	Book (277 pages)
A. George (1912)	<i>Dr. Maria Montessori: The Achievement and Personality of an Italian Woman Whose Discovery Is Revolutionizing Educational Methods</i>	Magazine article (6 pages)
E. Y. Stevens (1912)	<i>The Montessori Method and the American Kindergarten</i>	Magazine article (6 pages)
J. Tozier (1911)	<i>An Educational Wonder-Worker: The Methods of Maria Montessori</i>	Magazine article (17 pages)

## **Dr. Montessori's Long Involvement With Childhood Adversity and Trauma**

The first theme identified from the analysis relates to Dr. Montessori's long involvement with childhood adversity and trauma. It was evident that the four groups of children described earlier, whom Montessori encountered during an 19-year period (from 1898–1917), had been exposed to significant adversity and trauma before they came under the beneficial influence of Dr. Montessori's Method. Each group is described below.

### ***The Children From the Roman Psychiatric Hospitals (1898): A Background of Deprivation and Trauma***

In 1897, a year after graduating as a medical doctor, Dr. Montessori became a voluntary assistant at the psychiatric clinic affiliated with the University of Rome. Here, she worked alongside the eminent child specialist Clodomiro Bonfigli, who was conducting research on mental health disorders in children (Gutek & Gutek, 2017) and had a particular interest in the social determinants of mental illness (Povell, 2010). As Trabalzini pointed out, “she thus joined the psychiatric clinic's work group that saw the cooperation of illustrious scientists” (Trabalzini, 2011, p. 17). As part of her work, the young Dr. Montessori was required to go into the “asylums” (Montessori, 1964, p.31) to identify suitable candidates to take back to the clinic for study. It was in this capacity that she first became involved with children who, because they were unable to function at school or in their homes, were placed in these institutions that offered them no opportunities for learning or development.

In a series of newspaper articles published in 1915, Dr. Montessori reflected on the deprivation these children had suffered in these institutions and highlighted the facts that the children belonged to the poorest classes, were “persecuted and neglected even by their parents,”

and were excluded from education (Montessori, 2008, p. 263). According to her biographer, the children were “herded together like prisoners in a prison like room” (Standing, 1957, p. 28). Their days alternated between eating, sleeping, and staring into space. Their caretaker told Montessori with disgust how “after their meals, they would throw themselves on the floor to grab for dirty crumbs of bread” (Kramer, 1976, p. 58). Dr. Montessori observed that the children had no toys or materials of any kind and that the room was completely bare (Standing, 1957). She immediately recognized that these were not greedy children looking for more bread but were human beings, starved of emotional and intellectual stimulation and who therefore were using the breadcrumbs as playthings or learning materials (Kramer, 1976). In today’s terms, we would say these children were being exposed to severe neglect (Felitti et al., 1998).

In her efforts to understand the cognitive, social, and emotional problems evident in these children, Dr. Montessori’s research led her to the work of two almost forgotten French physicians, Jean-Marc-Gaspard Itard (1774–1838) and Édouard Séguin (1812–1880). The work of both doctors was to have a profound impact on Dr. Montessori’s approach to teaching developmentally challenged children, and later, children in general. Dr. Itard had dedicated years of his career to attempts to remediate a child referred to as *the wild boy of Aveyron*, a mute, feral child found running wild in the forests of France. Although this boy is usually referred to as a mentally challenged child, there is evidence that he was also a severely traumatized child. It is arguable that Itard’s methods, which so intrigued Dr. Montessori and had a profound influence on her, had as much relevance to the treatment of traumatized children as they had to the treatment of mentally challenged children. It is significant that the American journalist Josephine Tozier (who had spent months in Rome in 1910 talking with Dr. Montessori about her work with children and her sources of inspiration) wrote the first in a series of articles on Dr. Montessori’s work that were key in launching the Montessori movement in America. Tozier began by telling the story of the Wild Boy of Aveyron and stated



in her very first paragraph that this story “formed the starting-point of a process of thought and experiment” in Dr. Montessori’s mind. Tozier wrote:

*In a forest of the Department of Aveyron, France, some hunters, in 1798, caught a wild boy, apparently eleven or twelve years of age. His body was covered with scars, caused by briars, thorns, and the teeth of animals; but one scar on his throat seemed to show that whoever left him in the forest had first tried to murder him. (Tozier, 1911, p. 3)*

Itard’s writings, which meticulously record his attempts to remediate this undeniably traumatized child (who had suffered unimaginable physical and emotional abuse and neglect), as well as the later work and research carried out by Itard’s disciple and successor Séguin, had a huge impact on Dr. Montessori. Based on her talks with Dr. Montessori, Tozier wrote that the work of these two doctors “fell in with her own line of thought, giving precision and certainty to ideas already germinating in her mind” (Tozier, 1911, p. 4) and led directly to Dr. Montessori’s work in the Scuola Magistrale Ortofrenica [Orthophrenic School] in Rome (Tozier, 1911, p. 4), of which Dr. Montessori was a codirector. It is arguable that through her own observations and the recorded observations of these two doctors, Dr. Montessori was beginning to link the impact of adversity and traumatic experience with cognitive, social, and emotional functioning, or what she called (when referring to the children she worked with in 1897) “moral and mental incapacity” (Montessori, 2008, pp. 263–264). In this respect, she was more than 100 years ahead of contemporary literature on the topic (Cole et al., 2005; Felitti et al., 1998; Perry & Szalavitz, 2017; Treisman, 2017).

### ***The Children of San Lorenzo (1907): A Background of Poverty and Neglect***

Several years later, in the early 1900s, Dr. Montessori began what was to become her acclaimed work in San Lorenzo in Rome, an extremely impoverished district in which an

Italian building society sought to bring social improvements by providing tenement accommodation that would include a day-care facility for “all the little ones between the ages of three and seven” who were unable to attend the public schools (Montessori, 1964, p. 43). Foschi (2008) stated that Dr. Montessori, who had become well known “as a pedagogical expert” (p. 243), was invited “to direct the educational activities” of these facilities (p. 244).

On Sunday, January 6, 1907, the first Children’s House, as the facilities were called, was officially opened in a refurbished tenement in the slums of San Lorenzo. In *The Secret of Childhood*, (1936), Dr. Montessori included a quotation that she referred to as “something I wrote long ago, which I have discovered in a heap of old papers, which may be of documentary interest” (p. 120). The quotation paints a vivid picture of the children’s tearful entry to the Casa dei Bambini and the poverty and neglect to which they had been exposed:

*They were tearful, frightened children, so shy that it was impossible to get them to speak; their faces were expressionless, with bewildered eyes as though they had never seen anything in their lives. They were indeed poor, abandoned children, who had grown up in dark, tumbledown, slum dwellings, with nothing to stimulate their minds, and without care. Everyone could see they suffered from malnutrition; it was not necessary to be a doctor to recognize that they were in urgent need of food, open air life, and sunlight. (Montessori, 1936, p. 123)*

These children had experienced chronic poverty and neglect, or what we would today refer to as ACEs (Felitti et al., 1998), and Dr. Montessori immediately recognized that their emotional and social anxieties were inextricably linked to this experience.

### ***The Children of Messina and Reggio Calabria (1908): A Sudden Exposure to Adversity and Trauma***

Not long afterward, on December 28, 1908, at approximately 5:20 a.m., a violent earthquake hit Messina and Reggio Calabria with devastating force. The quake was followed within minutes by a powerful tsunami that caused 40-foot tidal waves to crash down on the coastal cities, reducing this area to little more than a heap of rubble (Pino et al., 2008). Thousands were trapped under the debris, suffering horrific and mostly fatal injuries. The death toll was estimated to be in the region of 80,000 to 100,000 (Bressan, 2012; Pino et al., 2008). There were some survivors, many of them children who “were left traumatized, homeless, and orphaned” (Mayfield, 2006, p. 5). Some were found days after the earthquake wandering around in the ruins, shocked and traumatized. The earthquake left many children orphaned, and there was an urgent need to protect the survivors from further trauma. Through the press, the Italian government called on all those who could help these children to step forward (Moretti, 2014).

In *The Secret of Childhood*, Dr. Montessori (1936) reported that 60 children were accommodated in a specially formed Montessori school, which Anne George (1912) reported was located in the Franciscan convent on Via Giusti, under the patronage of Queen Margherita of Italy. Subsequently, in 1910, the nuns received training in the Montessori Method (Kramer, 1976). Dr. Montessori described the traumatized state of the children:

*Here were orphans who had survived one of the greatest catastrophes, the Messina earthquake (1908), sixty small children discovered among the ruins. No one knew either their names or their social status.... This terrible shock had reduced them to near uniformity, they were numbed, silent, absent-minded. It was hard to make them eat,*

*hard to get them to sleep. At night they could be heard screaming and crying.*  
(Montessori, 1936, p. 152)

In this passage, Dr. Montessori shows her understanding that this terrible shock had traumatized the children, causing them to display what we would now refer to as posttraumatic stress.

***The Children of France and Belgium (1916): A Protracted Exposure to Adversity and Trauma***

Almost 10 years later, in the summer of 1916, when Europe was in the throes of the First World War, Dr. Montessori made a short visit to France to inspect the Montessori schools there (Montessori, 1917/2013). She found that all of the Montessori schools had been forced to close, as teachers dedicated themselves to helping the Red Cross (Montessori, 1917/2013). However, she found that there was one notable exception—an American teacher named Mary Cromwell, who had been trained in the Montessori Method of education and had personally organized and funded Montessori classes for French and Belgian refugee children (Montessori, 1917/2013). Cromwell witnessed firsthand the traumatizing impact of war on children. In a pamphlet she published in 1916 to raise funds to support her work with these war-torn children, she graphically described the various psychological presentations of the children. Some children were numb and unresponsive: “A sort of stupor invaded them and rendered them, for a long time, incapable of interest in anything” (Cromwell, 1916). Other children were in a constant state of alertness:

*[The children’s] perpetual plans were to pile up the material, even the heaviest objects, as if haunted by the desire to reconstruct; or their acts reflected the scenes they had*

*lived through in their invaded villages. With their small chairs and tables, they improvised cellars in which to hide most of the day, and the boys showed great enthusiasm in carrying, as guns, the long bars intended to commence arithmetic, these agitated days were repeated for weeks. (Cromwell, 1916)*

Dr. Montessori vividly described the kind of psychological disturbance evident in the children:

*There is found, in these refugee children, a special form of mental disturbance, which constitutes a real mental wound—a lesion that is as serious as, if not more serious, than wounds in the physical body.... These children came to her (Miss Cromwell) in a state of stupor, incapable of understanding, frightened at the approach of anyone, afraid by day as well as by night. (Montessori, 2017/2013, p. 37)*

Dr. Montessori believed that these children were suffering from deep-rooted psychological difficulties: “these unfortunate little ones...are psychologically or mentally mutilated” and were suffering from “wounds of the nervous system” (Montessori, 1917/2013, p. 39). These French and Belgian children had suffered what we would now call acute trauma as a result of this unexpected, man-made disaster (i.e., war) to which they had been exposed.

In sum, these four groups of children, the “persecuted,” “neglected,” and “rejected” children from the Roman psychiatric hospital (Montessori, 2008, p. 263); the “tearful, frightened children” of San Lorenzo (Montessori, 1936, p. 123); the “numbed, silent, absent-minded” children of Messina and Reggio Calabria (Montessori, 1936, p. 151); and the “psychologically or mentally mutilated” French and Belgian children (Montessori, 1917/2013, p. 39) shared one characteristic: which was - all had been victims of ACEs or trauma, which Dr. Montessori recognized required a specific kind of healing and intervention.

## **How the Montessori Method Facilitated Healing From the Effects of Adversity and Trauma**

The second theme identified from the analysis relates to how the Montessori Method facilitated healing. The evidence suggests that the Montessori Method facilitated healing and recovery by (a) calming and regulating the children, (b) reorganizing the disorganized brain, (c) preventing mental strain through the use of muscle memory, and (d) promoting the currently recognized key principles of TIP: safety, collaboration, choice, and empowerment. The next paragraphs elaborate on these points.

### ***Activities That Calmed and Regulated the Children***

Many eyewitnesses visiting the Montessori schools between 1907 and 1917, in which the last three of the four groups of trauma-impacted children described above were accommodated, noted that the children spent considerable time each day engaged in Practical Life, Sensorial, and cultural exercises that appeared to calm them. The Practical Life exercises involved either gross motor activities (e.g., sweeping courtyards, digging and weeding gardens, transporting soil back and forth in wheelbarrows, feeding and grooming animals) or fine motor activities (e.g., fastening and unfastening button, buckle, and lacing frames; folding and unfolding cloths; scrubbing tabletops; laying out mats and cutlery on tables for dining), as well as other practical and overtly meaningful exercises that required repetitive, rhythmic movements. These movements are what Dr. Montessori termed *synthetic movement*, referring to movement that is not random but that requires that “movements of the hands are guided by the mind” (Montessori, 1936, p. 149) and that they carry out a specific purpose, with the body and the brain working in unison so that mental and motor activities are inseparable. She argued that movement without thought was chaotic, and thought without movement induced fatigue

(Montessori, 1964). Standing (1957) referred to Dr. Montessori's interpretation of synthetic movement as "movement ordered and directed by the mind to an intelligible purpose" (p. 214). The Practical Life exercises described above all require the child to use synthetic movements, and it is these synthetic movements that appear to promote repetition of the activity, which in turn brings regulation, calm, and tranquility (Bailey, 1915; Cromwell, 1916/2006; Fisher, 1912; George, 1912; Montessori, 1936).

Another feature of the Practical Life exercises relates to what we now call mindfulness. *Mindfulness* has been described as "a quality of focused attention on the present moment accompanied by a non-judgemental stance" (Lillard, 2011, p. 2). George and Fisher described this quality of focused attention in two particular Practical Life exercises that were initially developed to test the children's hearing and develop their equilibrium, respectively. For example, the first of these—the daily Silence Game—involved the children silently tiptoeing to the teacher when their name was whispered; George (1912) commented on the calming effect of this activity: "The little bodies relax themselves softly, the breath comes evenly, and each child with his whole being settles himself to enjoy the silence.... The clock ticks; soft sounds come in from the cloister...as the silence grows" (p. 29). Fisher (1912) remarked on the children's "trance-like immobility" (p. 45) during the game and the "expression of utter peace" (p. 45) on the children's faces, stating that they "emerge from it sweeter, more obedient, calmed and gentler" (p. 47). In the second activity, Walking on the Line, the children focus their mind on balancing as they carefully walk on a large oval chalk line on the floor, sometimes holding a bell they try not to ring. According to one reporter (Tozier, 1911), the concentration and integration of mind and body required by the Silence Game "calmed all excessive excitability and restored placidity and tranquility. Sometimes [the children] ask for it twice in the day" (p. 15). These exercises seemed to represent mindful activities, producing a state of calm and appearing instrumental in promoting the children's recovery. This emergence of a state of calm

after the practice of these two activities is consistent with contemporary research on trauma and highlights the important role of mindfulness for trauma survivors in facilitating the process of recognizing the ebb and flow of emotions and physical sensations, thereby illustrating the importance of emotional regulation (Alexander, 2019; Jennings, 2019).

A further feature of the Practical Life activities that helped regulate the children was the fact that many of these activities, which the children were free to engage in spontaneously, frequently took place outdoors, which “at once promoted their development and their happiness,” according to one eyewitness (White, 1914, p. 18). In addition, the children frequently ate their meals outdoors. Contemporary research suggests that outdoor activities can have therapeutic benefits for those who have been exposed to adversity or trauma because they help to normalize heart rate and blood pressure, which are often elevated by traumatic experiences (Sorrels, 2015). Other researchers have stated that the calming sounds of nature can reduce levels of the stress hormone cortisol in the body, which in turn can help reduce the stress response (Mulholland & O’Toole, 2021).

The Sensorial activities involved the use of scientifically graded and sequenced objects that induced patterned, repetitive, rhythmic acts as the child sorts, matches, compares, contrasts, classifies, and categorizes objects. The children were free to repeat these activities as many times as they felt the need to. For example, the Cylinder exercise, which involves inserting cylinders of varying sequential dimensions into a block of wood, seemed to induce repetition. Dr. Montessori herself described how, at the beginning of her experimental work in San Lorenzo, she witnessed a child in deep concentration repeating this exercise 42 times (Montessori, 1936). When the child had finally finished, she smiled and looked very contented. Dr. Montessori (1936) remarked that the child’s concentration “was accompanied by a rhythmic movement of the hands, evoked by an accurately made scientific graduated object”



(p. 127). She asked the teachers not to prevent but to facilitate this repetition by not interrupting the child (Montessori, 1964). Likewise, eyewitnesses who visited the early Montessori schools commented on how the children frequently repeated the Sensorial activities over and over again (Fisher, 1912; Tozier, 1911), and when they finally stopped, they displayed a notable calmness and tranquility.

Children also frequently engaged in cultural activities, such as dance, music, movement, art, and sculpting, which involved repetitive, rhythmic movements. Eyewitnesses noted that these kinds of cultural activities calmed and regulated the children by the use of rhythm. Bailey (1915), in particular, described some of these activities in which the children “keep time to rhythmic music,” (p. 26) such as marching to a piano tune, sometimes slowly, sometimes quickly, “over and over again” (p. 22). She referred to other exercises “in which the little ones sing in time to the rhythmic movement of their feet” (p. 25) and said that these were all “rhythmic activities carried out upon a line” (p. 24). Artwork, such as clay modeling and drawing, were also observed by eyewitnesses to calm the children through the use of repetitive, rhythmic actions (Cromwell, 1916/2006).

Notably in this context, contemporary research from the field of neuroscience has demonstrated how neural dysregulation occurs in the aftermath of trauma, often leaving children feeling anxious, impulsive, and emotionally unstable (Perry, 2009). Research also shows how such dysregulation can be brought back into equilibrium by engagement in activities that are rhythmic and repetitive and that ultimately reduce anxiety and other “trauma-related symptoms” (Perry, 2009, p. 243). Therefore, it is arguable that frequent engagement in these repetitive, rhythmic activities likely played a major role in the healing or recovery of these children.

### *Activities That Organized the Disorganized Brain*

Media reports also alluded to the tranquility the Sensorial activities brought to the children, and eyewitnesses pondered the extent to which this tranquility was caused by the Sensorial materials' ability to encourage clarity of thinking and eliminate confusion (Tozier, 1911, p. 7). For instance, one eyewitness who had observed children engaged in these Sensorial exercises wrote, "Nervousness gives way to tranquility. The happy tranquility to which the children come after a few weeks of independent work with the sense-training exercises is perhaps the most noticeable feature" (George, 1912, p. 26). Cromwell also conveyed to Dr. Montessori her opinion that working with these materials provided "a veritable cure" of all the children's ills (Montessori, 1917/2013, p. 37). Other observers suggested that the Montessori Sensorial materials were hugely beneficial to the children because they were meticulously designed to enable them to focus their attention on a single task and element such as color, shape, or weight, thereby eliminating unnecessary distraction and fostering a sense of clarity and calm upon task completion (Fisher, 1912).

As noted above, contemporary research shows that neural dysregulation can often occur after exposure to trauma, leaving the child feeling chaotic and subject to constant confusion because of the intrusion of sudden and unsolicited fragmentary memories that mix up past and present experiences (Sorrels, 2015). Overall, it seemed that the Montessori Sensorial activities helped to reorganize the disorganized brain (caused by trauma) through their emphasis on the meticulous sorting, comparing, contrasting, and categorizing of objects (Phillips & Phillips, 2016). This engagement in repetitive activity with scientifically designed materials, which incorporated gradations and sequencing into their construction, arguably played an important role in the children's recovery; all of these activities are now known to have a regulatory

function and to facilitate healing via what neuroscientist Bruce Perry called “patterned, repetitive, neural input to the brainstem” (Perry, 2009, p. 243).

### ***The Prevention of Mental Strain by the Use of Muscle Memory***

Eyewitnesses noted that the Montessori Method, by its use of *muscle memory* (i.e., a type of memory that involves committing a specific motor task into memory through repetition), avoided exposing the children to mental strain. Specifically, media reports (e.g., Tozier, 1911) alluded to how the children in Dr. Montessori’s early schools learned to feel sounds and numerals as the teacher guided their fingers over Sandpaper Letters and Numbers so that they could develop a muscle memory of their shapes. Likewise, a range of objects was used to teach mathematical principles, including, for example, long rods that required the children to stretch out their arms to hold the longest rod. The basic premise underlying these approaches was that they helped the child embody both language and mathematical concepts through the use of muscle memory, which was thought to reduce mental strain (Tozier, 1911) and in turn help with recovery. Stevens (1912) claimed that Dr. Montessori, “with a physician’s knowledge of a human being and a teacher’s insight into child life...shows us how to protect the nervous system from strain” (p. 81). Another observer wrote, “The most conspicuous of Maria Montessori’s triumphs is that of teaching quite young children, without putting the smallest strain on their faculties, first to write and then to read,” (Tozier, 1911, p. 6); she added that Dr. Montessori “goes personally into the classes to show her teachers how to handle the children so that their nerves may be kept calm and their brains left un-taxed” (Tozier, 1911, p. 132). Some eyewitnesses were aware of Dr. Montessori’s understanding of the neurological implications of her methods. One of them (Stevens, 1912) wrote that Dr. Montessori “realises the plasticity of the nervous system and the importance of building into its tissues by developing muscle memory, sensory associations, habitual reactions” (p. 81). Stevens appeared

to be using the word *plasticity* as we would today, to denote the quality of being easily shaped or molded. In summary, it seemed that these kinds of activities, based on muscle memory and the embodiment of concepts, helped protect the brain from becoming overtaxed. Contemporary authors have noted that children who have suffered adversity and trauma usually live in a constant state of alertness because they are continually scanning the environment to try to protect themselves and possibly others from danger (Treisman, 2017). This state can leave the brain overtaxed and stressed, so any expectation or requirement to absorb academic content may place an intolerable strain upon children; absorbing academic content via muscle memory clearly avoided strain, as evidenced by the fact that the children voluntarily kept repeating the exercises (Fisher, 1912; Tozier, 1911).

### ***The Promotion of the Key Principles of Trauma-Informed Practice***

A further factor identified as important to Dr. Montessori's apparent success in providing a healing environment was her promotion of what we now know to be key principles of TIP: safety, collaboration, empowerment, and choice (Fallot & Harris, 2009).

***Safety.*** Supporting children to feel safe is an essential principle of TIP (Fallot & Harris, 2009). Our analysis revealed that physical and emotional safety were ensured in Dr. Montessori's schools by several practices: the promotion of positive relational interactions, the absence of rewards and punishments, the use of self-correcting materials, and the facility for individual activity. Let us elaborate.

The promotion of positive, relational interactions in the schools helped reduce fear in the children and promoted a feeling of safety. Referring to the children from the Roman psychiatric hospitals or "asylums," Dr. Montessori wrote:

*When these children from the streets and from the asylums entered my school they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first time they were made to feel that they were wanted and desired.* (Montessori, 2008, p. 264).

Early eyewitnesses described the children's relationships with their teachers as warm, affectionate, and respectful (Bailey, 1915; Cromwell, 1916/2006; Fisher, 1912; George, 1912; Montessori, 2008; Tozier, 1911). One eyewitness (Bailey, 1915) described how the directress, when responding to a little boy's state of withdrawal (the child in question had lost both his parents in the Messina and Reggio Calabria earthquake), would stop beside the boy's chair and "hold his hand, kindly for a minute in hers, or just bend over him, smiling straight down into his face" (p. 38). She would then repeat the words, "No one will hurt this little man of ours. He loves us and we love him" (p. 38). She comforted the child repeatedly with loving words "until one day her patience reaped the prize of Bruno's [the boy's] answering smile and she felt his two hungry little arms clasping her" (p. 38). Dr. Montessori instructed her teachers to always be mindful of a child's possible exposure to traumatic events. She told them to consider the child:

*Has the child had any frights, or other kinds of shock?... If the child is difficult or capricious, we seek for possible causes of this in the life he has led hitherto.... If we know what upsets have occurred at each period of the child's life, we can estimate their gravity and probable response to treatment.* (Montessori, 1967, p. 196)

Dr. Montessori was effectively instructing her teachers to ask themselves not "What is wrong with this child?" but rather to consider the question "What has happened to this child?" just as recommended in recent trauma literature (Perry & Winfrey, 2021); in this respect, too, she was considerably ahead of her time. Many eyewitnesses, as well as Dr. Montessori herself,

observed the absence of aggressive behavior or bullying among the children (Fisher, 1912; George, 1912; Montessori, 1964; White, 1914), as well as the children's genuine concern for and helpfulness toward each other, which featured prominently in many reports (Bailey, 1915; Fisher 1912; George,1912; Montessori, 1964; Tozier, 1911; White, 1914). For example, White wrote that "very little reproofing was done. Disputes went on in the playground, but for the most part no one interfered, and it ended.... The atmosphere was one of tranquility, love and trust" (White, 1914, p. 52). Current research points toward the centrality of attuned, responsive relationships in the healing process (Cherry, 2021; Maté, 2019; Treisman, 2017), which suggests that the promotion of positive relational interactions as part of the overall Montessori approach played a key role in promoting the recovery of these children.

The absence of rewards and punishments would have enhanced the children's feeling of safety. Media reports announced, "Rewards and punishments are rigorously banished from the Houses of Childhood" (Tozier, 1911, p. 10). Eyewitnesses noted that this removal of rewards and punishments helped reduce the children's anxiety and made them feel safe (especially those who had been exposed to physical abuse), thereby preventing retraumatization (Bailey, 1915; Tozier, 1911). Moreover, regarding rewards, recent research suggests that rewards can be harmful in that they may lead to feelings of being manipulated or controlled, and children who have been exposed to trauma have often been manipulated and controlled, frequently by the very people who were supposed to care for them (Treisman, 2017). Thus, rewards run the risk of retraumatization, which, according to much contemporary research, is to be avoided at all costs (Alexander, 2019; Jennings, 2019). This finding suggests that Dr. Montessori's removal of rewards and punishments may have had considerable merit and contributed positively to the children's sense of safety and their overall healing.

The provision of “self-corrective” materials (Fisher, 1912, p. 73)—that is, materials that indicate error, allowing the user to repeat the activity until the error is corrected—most likely provided the children with a feeling of safety because children who have experienced abuse have found that asking for help frequently leads to humiliating criticism or ridicule (Sorrels, 2015). Furthermore, self-correcting exercises can arguably help build resilience because of their requirement that users repeatedly correct their own mistakes. This necessity to correct one’s mistakes may lead to a kind of mild adaptive stress, or what neuroscientist Bruce Perry called “controllable, predictable stress,” which ultimately “helps build resilience” (Perry & Winfrey, 2021, p. 194). The continuous building of resilience, coupled with the experience of successful mastery of activities, leads to the development of autonomy and self-esteem, both of which are vital to trauma recovery.

The provision of opportunities for individual activity ensured a sense of physical safety. Many eyewitnesses indicated that, although group activities such as singing or dancing took place daily, individual activity was frequently chosen by the children themselves, often for protracted periods of time (Fisher, 1912; White, 1914). The children designated their own personal space by spreading a mat on the floor, on which others were required not to walk. This practice enhanced their feeling of safety. Children who have experienced adversity or trauma often feel a strong need for solitude to process their emotions without the added stress of having to engage with others (Perry & Winfrey, 2021). In this respect, individual activity provided the children with a safe space in which to process their emotions.

***Collaboration.*** Research also shows that collaborative activity can be healing for children who have experienced trauma because it removes the feeling of being “disconnected or separate from others,” often felt by children who have experienced adversity or trauma (Craig, 2016, p. 82). Many eyewitnesses commented on the amount of spontaneous

collaboration among the children, the positive effects of the mixture of age groups, and the amount of peer-to-peer teaching that took place. For instance, George (1912) wrote, “I have never ceased to be impressed by the fact that this method made it possible for children of different ages to work together.... The big ones helped the little ones, and the little ones watched the big ones” (p. 26). These collaborative activities appeared to promote a strong sense of connectedness to others and, in that respect, had a therapeutic effect.

***Empowerment.*** Eyewitnesses commented frequently on the remarkable level of confidence and empowerment evident in the children (Fisher, 1912; George, 1912; Tozier, 1911; White, 1914). This sense of confidence and empowerment came about through their growing independence, which was achieved through mastery of the exercises, especially the Practical Life skills. Achieving independence is very important for children who have been traumatized because it enables them to have some level of control over their lives, thereby leading to a sense of empowerment. This result can have therapeutic benefits for trauma-affected children because one of the aspects of traumatic experience is the sense of helplessness and powerlessness that often accompanies it (Treisman, 2017).

***Choice.*** Many eyewitnesses observed the children’s freedom to choose their own activities and to spend as much time as they wished engaged with them (Fisher, 1912; White, 1914). Freedom of choice is especially important for children who have been exposed to adversity or trauma because they have often previously experienced coercive control (Treisman, 2017); thus, providing choice can have an empowering and healing effect on them.

In summary, the application of these approaches resulted in indisputable psychological healing in the four groups of children described earlier, eventually contributing to the recognition by “child-specialists” (Montessori, 1936, p. 193) of Montessori schools as “Health



Homes (*Case della Salute*)” (Montessori, 1966, p. 181). Moreover, when Dr. Montessori addressed the British Psychological Society in 1919, “the keynote of the meeting was the question whether the work that she is doing will eventually make the work of the ‘nerve-specialist’ superfluous” (Radice, 1920, p. 139). In addition, Dr. Hugh Crichton- Miller—the famous Scottish psychiatrist and founder of the Tavistock Clinic in London, a mental health facility, who translated Dr. Montessori’s address—was reported as saying, “When the Montessori system is established in all schools, almshouses will have to be set up for the psychoanalysts” (Radice, 1920, p. 139). It is significant that Dr. Crichton-Miller’s work centered on developing psychological treatments for shell-shocked soldiers during and after World War I.

The four groups of children exposed to the Montessori Method demonstrated psychological healing in several ways. First, the children from the “asylums,” (Montessori, 1964, p. 31), who had been excluded from schools precisely because they could not learn, subsequently learned to read and write so well that Dr. Montessori presented them for the State Examinations; they passed, much to the shock of her colleagues, who considered her achievement to be “miraculous” (Montessori, 1964, p. 38). Second, the children from San Lorenzo, who were fearful, silent, without expression, and totally lacking in social skills on the opening day of the school, were reported to have become confident, talkative, full of expression, and extremely sociable in a short period of time (Fisher, 1912; Montessori, 1964; Tozier, 1911). They also were reported to have developed both practical and precocious academic skills. Most of them started writing at the age of 4 and reading shortly afterward (Tozier, 1911). Their overall development was so remarkable that professionals from the fields of journalism, medicine, social science, education, politics, and religion traveled to see them with their own eyes (Fisher, 1912). Third, the children who survived the Messina and Reggio Calabria earthquake—who were “numbed, silent, absent-minded,” (Montessori, 1936, p. 152),

unable to eat or sleep, and suffering night terrors—reportedly became calm and happy and began to excel in both practical and academic activities such as reading and writing. Again, educators from all around the world came to see them. One such eyewitness (Marguiles, 1913) wrote:

*It is difficult to describe what now happened in America, and I believe that it is unique in the history of education. A veritable frenzy took possession of educators. Educational magazines, scientific magazines, newspapers in the North, South, East, and West brought full-page illustrated articles on the work of Dr. Montessori and her Case dei Bambini” (p. 497).*

She then remarked that, in correspondence she had with Professor Howard Warren of Princeton University, he made a statement regarding Dr. Montessori’s Method:

*My own field is psychology, and I am quite prepared to meet any attacks from that quarter. My interest in Dr. Montessori’s method arises from the fact that it is good psychology.(Marguiles, 1913, p.502)*

Fourth, the French and Belgian refugees, who were initially in a state of stupor, incapable of understanding, and “frightened at the approach of anyone” (Montessori, 2013/2017, p. 37), were also reported to have become calm, happy, and engaged in various occupations, such as the care of plants and birds, drawing and modeling with clay, exercises with the Sensorial materials, and exercises with Sandpaper Letters and the Movable Alphabet (Cromwell, 1916/2006). Cromwell also reported that the children covered the blackboards with simple words and shortly afterward were able to write letters to their fathers in the trenches. She added that they subsequently engaged in the advanced activities of the Montessori curriculum for older children, with great success.

## **Dr. Montessori's Proposal for Trauma-Informed Courses for Teachers and Nurses**

The third and final theme identified from the analysis relates to Dr. Montessori's proposal to establish trauma-informed training courses for teachers and nurses to enable them to better meet the psychological needs of traumatized children, particularly by war and natural disasters. These courses would form part of the work of an organization she hoped to establish and call the White Cross. She envisioned this as a sister organization to the Red Cross but with the specific aim of addressing the psychological needs of children who, as victims of such adversities as wars and natural disasters, were displaying the signs and symptoms of trauma. A 1916 newspaper article ("The White Cross: Dr. Montessori's Scheme") reported that Dr. Montessori, "whose method has a wonderful calming influence on nervous children," (para. 1) was making plans to deliver "a theoretical and practical course in the Montessori method as especially applied to children under war conditions," (para. 2) as part of a larger program to be delivered "with the assistance of medical specialists in nervous diseases" (para. 2). The article implied that this was to be a large-scale project that would "send out working groups to France, Belgium, Serbia, Romania, Russia, and other European countries" (para. 3). A similar article published in 1917 ("The White Cross: Care of Child Victims") reported that the aim of the White Cross was to "restore the injured child- mind to normal activity and joy" (para. 2). Later, in 1917, while in San Diego delivering a formal address, Dr. Montessori suggested that her proposal for a trauma-informed course as part of the work of the White Cross reflected the culmination of years of active work and reflection on "the treatment of the nervous" (Montessori, 1917/2013, p. 39). She said, "My long study and work as a physician and then as an educator have led me to carefully consider the care of the nervous system" (Montessori, 1917/2013, p. 39). Mayfield (2006) also highlighted Dr. Montessori's understanding of the importance of the child's psychological as well as physical health:

*[Dr.] Montessori realized that, while providing for the physical and medical needs of children was essential during disasters, their psychological and emotional needs should also be addressed. Her recognition of the traumas of victims of the Messina earthquake, plus her observations of schools for war refugee children in France, and the devastation of World War I contributed to her call for an international organization to address these children's needs. (p. 5)*

Mayfield (quoting Babini & Lama, 2000, p. 288) further pointed out that, as early as 1915, Dr. Montessori “expressed her wish to found an organization” to be called “una croce bianca dei bambini” [a white cross for children] (Mayfield, 2006, p. 5).

Dr. Montessori emphasized that an essential element of the White Cross organization would be the preparation and delivery by an interdisciplinary team of an intensive, free-of-charge course to prepare what she called *teacher–nurses* to rehabilitate and restore mental health to these troubled children. These White Cross workers would be a combination of nurses and teachers who would “specialize in nervous diseases and psychic or mental ills” (Montessori, 1917/2013 specialists, who should put to the use of these individuals all that science has discovered in order that they may care for and cure these nervously suffering children” (Montessori, 1917/2013, p. 40). Dr. Montessori (1917/2013) also emphasized that these teacher–nurses should learn “special methods of education,” (p. 40), by which she meant the Montessori Method, which she said Mary Cromwell had described as “a veritable cure” (p. 37) of the war-torn children’s ailments.

Dr. Montessori spoke authoritatively about the role of education as a response to nervous diseases cannot be by medicine and may properly be called education” (Montessori, 1917/2013, p. 39). She highlighted the urgent need for the coming together of experts in medicine and science to inform this intensive program for teacher–nurses. She also proposed a

detailed study to fully investigate trauma and traumatic responses in these children. It appeared to her that “an organization of people preparing to go to the assistance of these children should first make a study of the child—a wide study based upon observations of the various psychological phenomena exhibited in these war children” (Montessori, 1917/2013, p. 40). However, while Dr. Montessori was tireless in her efforts to gain support for the establishment of the White Cross, her proposal was ultimately unsuccessful.

## **Discussion**

Currently, there is a strong interest in finding ways to incorporate trauma-informed practice into education (Alexander, 2019; Cossentino, 2016; Craig, 2016; Jennings, 2019). Our findings reported here show that the Montessori Method, as practiced in the early schools, was by its very nature both trauma informed and trauma responsive. After years of research and working intensively with vulnerable children, Dr. Montessori found a way of helping many children recover, to a greater or lesser extent, from adversity and trauma so that they could enjoy life, thrive, and excel. Essentially, she created an environment in which children who had been harmed by adversity or trauma could benefit therapeutically. This was achieved by the children’s daily engagement in a range of daily practical, sensorial, academic, and mindfulness-based activities that involved music, movement, dance, art, and horticultural pursuits. The children were free to engage in these activities at their own pace, and all of these activities appeared to have a healing impact on their neurological, social, emotional, and cognitive well-being. This healing impact appeared to lead directly to positive learning and academic performance, as well as other aspects of overall well-being, such as improved self-esteem and independence. A central element of the Montessori Method appeared to be the freedom the children were given to select their own materials and activities and to engage with them for as long as desired. Essentially, the children controlled their own therapy and dosage.

This practice is surely unique in the history of education. Another key distinguishing factor underpinning Dr. Montessori’s approach to trauma was that healing or the promotion of recovery was not seen as an add-on but instead was woven into the very fabric of the school—the materials, the approaches, the teachers, and the entire school environment. Again, considerable evidence today suggests that such whole-school approaches offer the most effective means to tackle mental health and well-being and to incorporate trauma-informed approaches within schools and other educational settings (Cole et al., 2005; Craig, 2016; Walpow et al., 2016).

All evidence suggests that Dr. Montessori’s pedagogical approach was deeply influenced by her involvement with trauma-affected children, to the point that in later life, she began to see mental health and well-being as fundamental to education (Montessori, 1917/2013). This understanding of the vital importance of mental health is very much in line with contemporary thinking and research that focuses not only on the need to support the mental health and well-being of children in schools, but also on identifying ways to incorporate TIP into education to specifically address the impact of ACEs on children’s social, emotional, and cognitive functioning (Alexander, 2019; Craig, 2016; Jennings, 2019).

Throughout her life, Dr. Montessori was relentless in advocating for schools that promote and support psychological well-being in children so that they might be better able to find joy and happiness, whatever their circumstances. The question now is “How can we build on this?” This question will be the focus of stage two of our study, where we will incorporate the findings from this documentary analysis of archival accounts of Dr. Montessori’s early schools with the contemporary knowledge base of trauma and trauma-informed practice to design an ongoing professional-development program, initially directed at practicing teachers, both Montessori trained and non-Montessori trained. The program will be designed to facilitate

an understanding of how the mind and body are affected by trauma and the different coping strategies used by children. This program will draw on the key aspects of the Montessori Method that proved effective in facilitating psychological healing in children as revealed in our historical analysis, and it will also be grounded in the key principles of TIP (i.e., safety, collaboration, empowerment, choice, trust, respect for diversity [Fallot & Harris, 2009]). This program will be delivered and tested (in service) in a number of Montessori and non-Montessori preschools, with the aim of continuing and building upon Dr. Montessori's important early work.

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## References

- Alexander, J. (2019). *Building trauma-sensitive schools: Your guide to creating safe, supportive learning environments for all students*. Brookes.
- Babini, V. (2000). Science, feminism and education: The early work of Maria Montessori. *History Workshop Journal*, 49(1), 44–67. <https://doi.org/10.1093/hwj/2000.49.44>
- Bailey, C. S. (1915). *Montessori children*. Holt
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Bressan, D. (2012, December 28). December 28, 1908: The tsunami of Messina. *History of Geology*. <https://blogs.scientificamerican.com/history-of-geology/december-28-1908-the-tsunami-of-messina/>
- Burke Harris, N. (2019). *The deepest well: Healing the long-term effects of childhood adversity*. Marine Books.
- Cherry, L. (2021). *Conversations that make a difference for children and young people: Relationship-focused practice from the frontline*. Routledge.
- Cole, S. F., Greenwald O'Brien, J., Gadd, M. G., Ristuccia, J., Wallace, D. L., & Gregory, M. (2005). *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children, Trauma and Learning Policy Initiative. <https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>
- Cossentino, J. (2016). Montessori schools help children exposed to trauma. In L. Flores Shaw (Ed.), *The Montessori White Papers, Vol. 2* (pp. 9–16). White Paper Press.

- Craig, S. E. (2016). *Trauma sensitive schools: Learning communities transforming children's lives, K-5* (Illustrated ed.). Teachers College Press.
- Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian refugees. *AMI Communications*, 2, 11–13. (Original work published 1916)
- Fallot, R. D., & Harris, M. (2009). Creating cultures of trauma-informed care: A self-assessment and planning protocol. *Community Connections*.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)
- Fisher, D. C. (1912). *A Montessori mother*. Henry Holt & Company.
- Foschi, R. (2008). Science and culture around the Montessori's first "Children's Houses" in Rome (1907–1915). *Journal of the History of the Behavioral Sciences*, 44(3), 238–257. <https://doi.org/10.1002/jhbs.20313>
- George, A. E. (1912, July). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping*, 55(1), 24–29.
- Gutek, G., & Gutek, P. (2017). *Bringing Montessori to America: S.S. McClure, Maria Montessori, and the campaign to publicize Montessori education*. University of Alabama Press.
- Herman, J. L. (2015). *Trauma and recovery: The aftermath of violence—from domestic abuse to political terror*. Basic Books.
- Jennings, P. A. (2019). *The trauma-sensitive classroom: Building resilience with compassionate teaching*. W. W. Norton & Company.

- Kramer, R. (1976). *Maria Montessori: A biography*. Addison-Wesley.
- Lillard, A. (2011). Mindfulness practices in education: Montessori's approach. *Mindfulness*, 2, 78–85. <https://doi.org/10.1007/s12671-011-0045-6>
- Marguiles, A. R. (1913). Dr. Montessori and her Method. *American Annals of the Deaf*, 58(5), 496–502. <https://www.jstor.org/stable/44464755>
- Maté, G. (2019). *When the body says no: The cost of hidden stress*. Vermilion.
- Mayfield, M. (2006). Maria Montessori: Advocate for children. *AMI Communications*, 2, 4–9.
- Maynard, B. R., Farina, A., Dell, N. A., & Kelly, M. S. (2019). Effects of trauma-informed approaches in schools: A systematic review. *Campbell Systematic Reviews*, 15(1-2), Article e1018. <https://doi.org/10.1002/cl2.1018>
- Montessori, M. (2013). The White Cross. *AMI Journal*, 1-2, 37–41. (Original work published 1917)
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. and Trans.). Longmans.
- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books. (Original work published 1912)
- Montessori, M. (1966). *The secret of childhood* (M. J. Costelloe, Trans.). Ballantine.
- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans). Dell. (Original work published 1949)
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series. Montessori-Pierson.
- Moretti, E. (2014). Beyond biological ties: Sibilla Aleramo, Maria Montessori, and the construction of social motherhood. *Italian Culture*, 32(1), 32–49. <https://doi.org/10.1179/0161462213Z.00000000022>

- Moretti, E. (2021). *The best weapon for peace: Maria Montessori, education, and children's rights*. University of Wisconsin Press.
- Mulholland, M., & O'Toole, C. (2021). When it matters most: A trauma-informed, outdoor learning programme to support children's wellbeing during COVID-19 and beyond. *Irish Educational Studies*, 40(2), 329–340.  
<https://doi.org/10.1080/03323315.2021.1915843>
- National Scientific Council on the Developing Child. (2020). *Connecting the brain to the rest of the body: Early childhood development and lifelong health are deeply intertwined, Working Paper No. 15*. <https://developingchild.harvard.edu/resources/connecting-the-brain-to-the-rest-of-the-body-early-childhood-development-and-lifelong-health-are-deeply-intertwined/>
- Overstreet, S., & Chafouleas, S. M. (2016). Trauma-informed schools: Introduction to the special issue. *School Mental Health*, 8, 1–6. <https://doi.org/10.1007/s12310-016-9184-1>
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–245. <https://doi.org/10.1080/15325020903004350>
- Perry, B. D., Pollard, R. A., Blakley, Y. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and use-dependent development of the brain: How states become traits. *Infant Mental Health Journal*, 16(4), 271–291.  
[https://doi.org/10.1002/1097-0355\(199524\)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B](https://doi.org/10.1002/1097-0355(199524)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B)
- Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook—what traumatized children can teach us about loss, love, and healing*. Basic Books.

- Perry, B. D., & Winfrey, O. (2021). *What happened to you? Conversations on trauma, resilience, and healing*. Pan Macmillan.
- Phillips, S., & Phillips, B. (2016). *Healing early childhood trauma: The Montessori way*. CreateSpace Independent Publishing.
- Pino, N. A., Piatanesi, A., Valensisi, G., Boschi, E. (2008). The 28 December 1908, Messina Straits earthquake ( $M_w$  7.1): A great earthquake through a century of seismology. *Istituto Nazionale di Geofisica e Vulcanologia*.  
<https://pubs.geoscienceworld.org/ssa/srl/article-abstract/80/2/243/143519/The-28-December-1908-Messina-Straits-Earthquake-MW>
- Povell, P. (2010). *Montessori comes to America: The leadership of Maria Montessori and Nancy McCormick Rambusch*. University Press of America.
- Radice, S. (1920). *The new children: Talks with Dr. Maria Montessori*. Frederick A. Stokes Company.
- Scocchera, A. (2013). Montessori, the White Cross, and Prof. Ferrari. *AMI Journal*, 1-2, 48–50. (Original work published 2002)
- Sorrels, B. (2015). *Reaching and teaching children exposed to trauma*. Gryphon House.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, 40, 77–82.
- Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. SAMHSA's Trauma and Justice Strategic Initiative.  
[https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf)
- The White Cross: Care of child victims of the war. (1917, September 24). *The Times of London*.

- The White Cross: Dr. Montessori's scheme for healing the wounded minds of child war victims. (1916, September 18). *London Daily News*.
- Thomas, M. S., Crosby, S., & Vanderhaar, J. (2019). Trauma-informed practices in schools across two decades: An interdisciplinary review of research. *Review of Research in Education, 43*(1), 422–452. <https://doi.org/10.3102/0091732X18821123>
- Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori. *McClure's Magazine, 37*(1), 3–19.
- Trabalzini, P. (2011). Maria Montessori through the seasons of the “Method.” *The NAMTA Journal, 36*(2).
- Trabalzini, P. (2013). Nobody left behind: Montessori's work in defence of children as victims of war. *AMI Journal, 1-2*, 42–45.
- Treisman, K. (2017). *Working with relational and developmental trauma in children and adolescents*. Routledge.
- van der Kolk, B. (2014). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Penguin.
- White, J. (1914). *Montessori schools: As seen in the early summer of 1913*. H. Milford.
- Wolpow, R., Johnson, M. M., Hertel, R., & Kincaid, S. O. (2016). *The heart of learning and teaching: Compassion, resiliency, and academic success*.  
<https://www.k12.wa.us/sites/default/files/public/compassionateschools/pubdocs/theheartoflearningandteaching.pdf>

## CHAPTER 5

### **The alignment between the *Regulate, Relate and Reason* model and the Montessori model.**

#### **(Study 2)**

This chapter contains the paper: “Does the Montessori Approach to Healing Trauma-Affected Children Align with the ‘Regulate, Relate, and Reason’ Phase of the NME? A thematic analysis” which is under review by the *Journal of Child and Adolescent Trauma*.

This paper is based on findings from Study 2, which integrated evidence from Study 1 with evidence from contemporary literature on trauma and trauma-informed practice to develop an innovative programme of continuing professional development (CPD) designed to enhance the capacities of early childhood teachers to support trauma-affected children. Study 2 was conducted by the researcher to answer the second research question: “Can historical and contemporary evidence be appraised and integrated to develop a robust CPD programme of Montessori-attuned, trauma-informed practice?”

**Does the Montessori Approach to Healing Trauma-Affected Children Align with the  
“Regulate, Relate, and Reason” Phase of the NME? A thematic analysis.**

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### **Abstract**

**Purpose** Given the pervasiveness of childhood trauma, there is a move to create models to support trauma-affected children in schools. The *Regulate, Relate and Reason* (3R's) phase of the Neurosequential Model in Education (NME) is an example. However, historical models such as Montessori, have largely been ignored. The aim of this study was to compare the 3R's of the NME with the Montessori model, (which historically was reputed to be effective in healing trauma-affected children) and examine whether Montessori's model aligns with the neuroscientific principles and practices undergirding the 3R's of the NME.

**Methods** Braun & Clarke's reflexive thematic analysis was used.

**Results** The three themes identified were: - how Montessori (a) intentionally incorporated activities into the curriculum that provided repetitive neural input to the brainstem thus helping children to regulate; (b) intentionally created a rich relational environment (a non-traditional teacher, mixed age groups and peer teaching); and (c) explained that children are neurobiologically unable, rather than unwilling, to use reason when they are distressed.

**Conclusion** This paper suggests that the century year old Montessori model aligns closely with the neuroscientific principles undergirding the NME (3Rs), and that evidence of this alignment could be empowering for the thousands of contemporary Montessori educators globally (who are increasingly facing the task of supporting trauma-affected children), because it will provide them with further scientific backing for the uniqueness of the Montessori model and may enhance their professional practice and confidence giving them a 'head-start' in relation to their ability to support trauma-affected children.

**Keywords** Neurosequential Model in Education . Montessori Method . Sequence of Engagement . Regulate, Relate, Reason . Trauma-informed Practice

## **Introduction**

The purpose of this study was to (a) examine whether or not the century year old Montessori educational model (Montessori, 1912/1964) aligns with the neuroscientific principles and practices underlying the “Sequence of Engagement - *Regulate, Relate and Reason*” (3Rs) phase of the NME and (b) to argue that evidence of such an alignment, could be beneficial and empowering for the thousands of Montessori educators globally who are increasingly facing the task of supporting trauma-affected children. Firstly, such evidence will enhance their interdisciplinary knowledge about the neurobiological implications of trauma so that they understand why repetitive activities work so effectively with trauma-affected children and help them to regulate. Secondly, it may improve their practice by giving them a greater understanding of relational neurobiology and why positive relationships are healing for trauma-affected children. Thirdly, it may improve their understanding of children’s behaviours by explaining the neurobiological science behind the fact that very distressed children cannot reason or engage rationally with either adults or peers and need to become regulated before they can reason, or access certain brain functions such as memory and executive functions that are mediated by the cortex and are vital for learning (Perry, 1999). Fourthly, it may boost their confidence in relation to supporting trauma-affected children because evidence that the Montessori model embodies a framework very similar to the (3Rs) of the NME, would arguably make it likely that Montessori schools would have a ‘head-start’ in relation to their capacity to support trauma-affected children.

Childhood adversity and trauma are prevalent and found in all socio-economic groups (Felitti et al., 1998). Research shows that they can have a detrimental impact on children's mental and physical wellbeing as well as their capacity to learn, relate to others, and function at home and in school (Craig, 2016). *Childhood adversity* includes exposure to neglect, abuse, and other negative experiences such as poverty, homelessness, discrimination, and racism (Felitti, et al., 1998; Merskey et al., 2017) and *childhood trauma* refers to exposure to either single or multiple overwhelmingly stressful experiences that can leave children psychologically and biologically damaged (Burke Harris, 2019; Perry & Szalavitz, 2017; van der Kolk, 2014). Research also shows that exposure to trauma is pervasive with up to two thirds of children exposed to a traumatic event before the age of 16 (National Child Traumatic Stress Network, 2020). Such exposure has been shown to lead to problematic emotional, social, and cognitive functioning in children with attendant behavioural issues in classrooms (Craig, 2016). Given the pervasiveness of trauma, and its negative impact on children, there has been a move among trauma experts to create models to help teachers to cope with trauma-affected children in schools (Perry & Graner, 2018). However, despite the fact that trauma "has shadowed humankind since our earliest days" (McSherry, 2021, p.1), there has been a failure among trauma researchers to examine historical approaches to healing trauma-affected children, thus leaving a gap in our knowledge about the effectiveness (or not) of such approaches. One of the aims of this paper is to fill that gap by examining the century year old Montessori approach to healing trauma-affected children and its recorded effectiveness or ineffectiveness; and exploring whether or not this approach aligns with modern approaches, specifically the *Regulate, Relate and Reason* phase of the Neurosequential Model in Education (NME).

### **The “Sequence of Engagement -*Regulate, Relate and Reason*” phase of the NME.**

The NME is a model developed by Dr. Bruce Perry, (the world-renowned child and adolescent psychiatrist, developmental neurobiologist, and senior fellow of the Child Trauma Academy), to help teachers to cope with trauma-affected children in schools (Perry & Graner, 2018). The NME is a non-therapeutic adaption of the Neurosequential Model of Therapeutics (NMT) also developed by Perry (Perry, 2006; Perry, 2009; Perry & Hambrick, 2008). The NME draws upon the NMT which Perry defines as “a developmentally sensitive neurobiologically informed approach to clinical work” (Perry & Hambrick, 2008, p. 39). The NME is Perry’s recommended approach for teachers trying to cope with the needs of children who have been affected by childhood trauma (Perry & Graner, 2018). The aim of the NME is not to ask teachers to become therapists, neuroscientists, or psychologists, but rather to educate school staff about the sequential nature of brain development and the impact of developmental trauma, and then guide teachers in how to apply that knowledge in their work with children ([www.neurosequential.com](http://www.neurosequential.com)). The NME principles apply to all children but are especially beneficial to children who have been affected by childhood adversity or trauma. The NME can guide teachers in developing strategies to reduce difficult behaviours in such children and increase their capacity to engage successfully in developmentally appropriate educational activities (Perry & Graner, 2018).

The “Sequence of Engagement - *Regulate, Relate and Reason* is based on neuroscientific principles (Perry, & Graner, 2018). It recognizes that when the stress response is activated as a result of exposure to trauma, or re-activated because of a trauma trigger, a child becomes dis-regulated, causing the temporary “shut-down” of certain cortical areas in the brain (Perry & Graner, 2018) and the fundamental need of the child is to get back into a state of homeostasis or internal balance/stability. Perry explains that this is best achieved through

engagement in what he calls “patterned, repetitive, somatosensory activities” such as singing, dancing, walking, running, breathing and other rhythmic activities (Perry, 2009, p. 252). Following the use of rhythmic activities to regulate and calm the child the next step in the sequence of engagement is to “relate”. Dr Perry and colleagues have documented the crucial role of “positive relational interactions” in the healing process for children who have been affected by trauma (Ludy-Dobson & Perry, 2010, p. 27), and explained that “The more healthy relationships a child has, the more likely he will be to recover from trauma and thrive” (Perry & Szalavitz, 2017, p. 258). For a teacher in a school situation, “relate” can simply take the form of (a) using a warm, friendly tone of voice when talking to children, (b) greeting children with a smile or a high five on arrival and throughout the day, and (c) using non-threatening body language such as getting down low when talking to young children so as not to tower over them. Relate always involves having an emotionally attuned adult, (someone who recognises, understands, and engages with another’s emotional state) available to the child. Following the use of rhythmic activities to regulate and calm the child, and positive, relational interactions to relate to the child, the next step in the sequence of engagement is “reason”, ie cortical engagement. Perry’s research shows us clearly why cortical engagement, for example answering questions such as “why did you do that?” cannot happen until the first two steps in the sequence of engagement happen i.e., firstly the child needs to be in a state of calm and secondly, they need to have the opportunity to relate to an emotionally attuned adult, who is also regulated. At this point, cortical engagement can happen, and it often takes the form of a dialogue between the now calm (regulated) child, who has started to respond (relate) to a compassionate, non-judgmental, emotionally attuned adult, and can now talk about the issues that are upsetting them (reason).

## **The Neuroscience Behind Perry's 3R Model and the Principle of Specificity**

Perry explains that in children who have been exposed to trauma which was significantly overwhelming for them “there will be a high likelihood of poor organisation and functioning in lower parts of the brain” especially in the brainstem and diencephalon (MacKinnon, 2012, p. 213). He points out that one of the most recognised effects of exposure to trauma is to “alter the functioning of the brain’s stress-response systems”, which emanate from the brainstem and diencephalon” (MacKinnon, 2012, p. 213/214). Despite this alteration, he explains that the human brain has the capacity to be altered by the property known as *neuroplasticity*, but he adds that “*a key principle of neuroplasticity is specificity*” (Perry & Ablon, 2019, p. 21). He explains the principle of “*specificity*” as the need to target specific neural networks if we wish to change them (p. 21). For example, in a recent publication, he states that, if you want to learn to play the piano, it is not sufficient to simply read about piano playing or watch other people playing the piano, he emphasises that you must physically put your fingers on the keys and play the piano yourself. The reason for this is that “you have to stimulate the parts of the brain involved in piano playing in order to change them” (Perry & Winfrey, 2021, p. 74).

He further points out that to change any neural network in the brain we need to provide “some form of patterned, repetitive activity” and he emphasises that one of the basics of neural change is activity or “*use-dependence*” (MacKinnon, 2012, p. 214). In other words, we must *repetitively* activate the neural networks we wish to modify. He states that, “Any neural network that is activated in a repetitive way will change” (MacKinnon, 2012, p. 214). He sums up this concept of ‘targeting’ specific neural networks by saying that if we want to provide re-organising, patterned, repetitive input “to reach the dysregulated or poorly organised neural networks involved in the stress response”, we need to provide “patterned, repetitive rhythmic somatosensory activity” (MacKinnon, 2012, p. 213/214).

## **The Concept of ‘Targeting’ Specific Neural Networks.**

The idea of ‘targeting’ specific neural networks may easily be misunderstood. When asked to explain the concept of “targeting the brainstem” Perry stated that this is a frequently misunderstood aspect of his work (MacKinnon, 2012, p. 213). He reiterated that, although it is a fact that because of the interconnectedness of the brain, it could be argued that it is an oversimplification to localise function to any specific area, at the same time, “the final mediating parts of the brain for any function can be localised” (MacKinnon, 2012, p. 213). For many years, Perry has argued that conventional clinical approaches to developmental problems in children (e.g. speech and language problems, learning difficulties, poor control of emotions) are often ineffective because they ignore the fact that the origin of these problems lies in disruptions to the development of brainstem and diencephalon monoamine neural networks. Consequently, he says, many clinical approaches to treating these problems are frequently ineffective because they do not target the source of the problem which is disruption to the development of “brainstem and diencephalon monoamine neural networks” (Perry, 2009, p. 243). Perry compares these ineffectual approaches to treating developmental problems in children, with the very effectual approaches to treating stroke victims. He writes: “the target of the intervention should be the innovating neural systems and not the area or the system that is the final mediator of the function/dysfunction” (Perry, 2009, p. 244). For example, he points out that, “physical exercise helps stroke victims recover speech” (Perry, 2009, p. 244). Perry also points out that even when the appropriate systems in the brain are “targeted”, clinicians “rarely provide the repetitions necessary to modify organized neural networks” (Perry, 2009, p. 244). He summarises the ineffectual approach to the treatment of many children as being due to two specific failures. Firstly, he says there is a failure to ‘target’ the correct brain areas, for example, he states that “clinical interventions often provide experiences that primarily target the innervated cortical or limbic (i.e. cognitive and relational interactions) regions in the

brain and not the innervating source of the dysregulation” (Perry, 2009 p. 244). Secondly, he says that even when the correct brain areas are correctly ‘targeted’, there is still a problem because he argues that “we rarely provide the repetitions necessary to modify organized neural networks” (Perry, 2009, p. 244) so there is an insufficient number of ‘repetitions’ to modify existing neural networks making it unlikely that neural systems will change, because neural systems can only be modified by repetitive activation. To put it simply, Perry’s argument is this: if we want to effect changes in the brain, we must specifically ‘target’ the neural networks we wish to modify and supply enough ‘repetitions’ to effect neural change. This paper aims to demonstrate that historically, Montessori did exactly this.

### **The Montessori Model**

Montessori education is “the largest alternative pedagogy in the world” (Debs, 2023, p. 283), appealing to poor, middle-class and wealthy families alike. It also appeals to the diverse belief systems of “Christians, Jews, Muslims, Hindus, and Buddhists” (p. 283). In addition, research shows that in an age when school choice is available in both the private and public sectors, interest in Montessori education is growing (Debs, 2019). The Montessori Method began in Rome, Italy. Its founder, Maria Montessori (1870-1952) was one of Italy’s first female psychiatrists with a particular interest in child mental health (Babini & Lama, 2000; De Stefano, 2022; Kramer, 1976; Standing, 1957). Graduating from the University of Rome in 1896, she immediately joined the staff of the Clinica Psyciatica, (Psychiatric Clinic) as a voluntary assistant doctor. Her early work involved her, first of all, in the care of children who were mentally challenged (Guttek & Guttek, 2017; Kramer, 1976) and later in the care of children who had been exposed to significant adversity and trauma (Phillips et al., 2022). In late 1906, as a consequence of her extremely successful experimental work with mentally challenged children, she was invited to direct the educational aspect of a potentially large social housing project in the impoverished district of San Lorenzo, in Rome (Foschi, 2008). This work



developed into what very quickly became known as “The Montessori Method” (Montessori, 1912/1964). This paper postulates that from its inception, the Montessori Method used an approach very similar to the NME’s “regulate relate and reason” model with trauma-affected children, but that Montessori’s approach was unique in that that (a) she purposely built into her curriculum specific activities (that are now recognised as providers of neural input to the brainstem), and thus helped the children to *regulate*, (b) she purposely introduced a non-traditional type of teacher, mixed age groups, and peer teaching (in accordance with the principles of what we now call relational neurobiology), and thus created and maintained a rich relational environment in her schools which helped trauma-affected children to *relate*, and (c) she purposely explained in her publications that dysregulated children are neurobiologically *unable* rather than *unwilling* to use reason or engage in activities which demand the use of higher level faculties when they are seriously distressed (Montessori, 1936). Consequently, she instructed her teachers not to try to reason with children when they were unreceptive to reason (Montessori, 1967) but instead, to offer regulatory activities and provide warm relational interactions (Montessori, 1936; 1967; 2008). Applying this approach, she first of all helped ‘mentally challenged’ children who had been expelled from schools because they were regarded as unteachable, to pass their State Examinations, and then, applying the same approach, witnessed a transformation in the emotional, social, and cognitive functioning of a large number of children living in an impoverished district in Rome, arousing worldwide interest in her pedagogical approach (Montessori, 2008).

### **Method**

The research question underpinning this study is - Does the Montessori Approach to Healing Trauma-Affected Children Align with the “Regulate, Relate, and Reason” Phase of the NME?

To answer this question, firstly, an analysis of available sources on the NME was conducted. These sources comprised of articles, books, seminars, interviews, and online courses relating to the NME. Secondly, an analysis of four of Montessori’s major publications, *The Montessori Method*, 1912/1964, *The Secret of Childhood*, 1936, *The Absorbent Mind*, 1967, and *The California Lectures*, 2008, was conducted. These four publications were selected because they are generally recognised as being reliable sources of Montessori’s core concepts. In addition, publications of eyewitnesses to Montessori’s early schools who commented on (a) the use of rhythmic exercises and activities, (b) the creation of rich relational environments and (c) the biologically respectful approach to children, were included in the analysis (Bailey, 1915; Cromwell, 1916/2006; Fisher, 1912; George, 1911). A Table of Data Sources is provided below.

**Table 1** List of Data Sources

Author and Date	Title of Document	Document
Perry B.D. (2006)	The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children. In N.B. Webb (Ed.) <i>Working with traumatized youth in child welfare</i> (pp. 27 – 52).	Book Chapter
Perry B.D. (2009)	Examining child maltreatment through a neuro development lens: Clinical applications of the Neurosequential Model of Therapeutics.	Article
Perry & Graner (2018)	<i>The Neurosequential Model in Education: Introduction to the NME Series: Trainer’s Guide</i> (NME Training Guide).	Book

Perry & Ablon (2019)	CPS as a Neurodevelopmentally Sensitive and Trauma-Informed Approach	Book Chapter
Perry & Hambrick (2008)	The Neurosequential Model of Therapeutics.	Article
Perry & Szalavitz (2017)	<i>The boy who was raised as a dog: And other...</i>	Book
Perry & Winfrey (2021)	<i>What Happened to You? ...</i>	Book
Mac Kinnon, L. (2012)	The Neurosequential Model An Interview with Bruce Perry	Article
Montessori, M. (1912)	<i>The Montessori Method.</i>	Book
Montessori, M. (1936)	<i>The Secret of Childhood</i>	Book
Montessori, M. (1967)	<i>The Absorbent Mind</i>	Book
Montessori, M. (2008)	<i>The California Lectures</i>	Book
Bailey, C. S. (1915)	Montessori Children	Book
Cromwell, M. R. (1916)	The Montessori Method Adapted to the Little French and Belgian Refugees	Pamphlet
Fisher, D. C. (1912)	A Montessori Mother	Book
George, A. E. (1912)	Dr. Maria Montessori: The Achievement and Personality of an Italian Woman whose Discovery is Revolutionizing Educational Methods	Article

These combined sources yielded a large amount of data. Braun and Clarke's reflexive thematic analysis was used (Braun & Clarke, 2006, 2022). Thematic analysis is the process of identifying themes (patterns) within qualitative data. It is a method rather than a methodology which means it is not tied to a particular epistemological or theoretical perspective. This makes it a flexible method. It involves an iterative process consisting of six steps which are (a) familiarization (reading and re-reading the literature/data to become familiar with the content and to generate further insight into the topic), (b) generating initial codes (initial coding reduces large amounts of literature/data into small chunks of meaning in a systematic fashion), (c) searching for themes (a theme is a pattern that captures something significant or interesting about the literature/data, this step involves collating codes into potential themes and gathering all literature/data relevant to each potential theme), (d) reviewing the potential themes (here the aim is to review, modify and develop the potential themes that were identified in step three and consider whether the potential themes work in the context of the entire data set and ascertain that the data supports the themes), (e) defining and naming themes (here the aim is to identify the essence of what each theme is about and to generate clear names for each theme), (f) writing up the report, (usually in the form of a report, journal article or dissertation).

## Results

The analysis identified three themes – (all of which contain sub-themes) and all of which answer the research question by demonstrating that the Montessori approach aligns with the neuroscientific principles underlying the Regulate, Relate and Reason (3R) phase of the NME. These themes are (1) The intentional use of *regulating* activities in early Montessori schools (2) The intentional provision of *relational* richness in early Montessori schools and (3) The biologically respectful approach to *reason* in early Montessori schools. These themes and sub-themes are now examined.

## **The intentional use of *regulating* activities in early Montessori schools**

The first theme identified from the analysis, relates to the intentional use of *regulating* activities in early Montessori schools. This theme has three sub-themes: (1) Rhythmic exercises and activities; (2) Patterned exercises and activities; (3) Repetitive exercises and activities.

During the decade 1907 to 1917, Montessori and her teachers (called directresses) worked with diverse groups of children who had been *psychologically harmed* by exposure to both chronic and acute experiences of adversity and trauma. Specifically, she and her teachers worked with – (1) the extremely impoverished San Lorenzo children who had grown up exposed to both physical and emotional neglect; (2) child survivors of the devastating Messina earthquake (1908) which left them orphaned and homeless); and (3) child survivors of WW1 - French and Belgian child refugees who witnessed horrendous atrocities when their land was invaded, leaving them homeless and mostly orphaned (Phillips et al., 2022). The behaviours of these children (documented by Montessori, and eyewitnesses – (Bailey, 1915; Cromwell, 1916/2006; Montessori, 1913/2013; 1936) indicated that their traumatic experiences had left them with high levels of anxiety and stress which today would be referred to as PTSD. While working with these diverse groups of children, Montessori and her teachers found that one factor that appeared to have a remarkably regulating effect on them was engagement in activities that involved patterned, repetitive, rhythmic movements.

### ***Sub-theme 1: Rhythmic exercises and activities***

Eyewitnesses commented on the regulating effect rhythmic activities had on the children. These activities included balancing exercises, practical life exercises, music, movement, and dance, colouring outline drawings and ‘metal insets’, and working with clay (Bailey, 1915; George, 1912; Cromwell, 1916/2006). Bailey wrote that the children became calm from physical exercises such as – “Climbing up and down a very short ladder”; “Stepping

through the rungs of the ladder as it is laid upon the ground or the floor”; and “Ascending and descending a short flight of circular steps” made for the purpose (Bailey, 2015, p. 24). Montessori designed many types of balancing apparatus, which she saw as a first step towards helping the trauma-affected children she encountered in her schools (Montessori, 1912/1964). Bailey described how rhythmic musical exercises were used with the children. She wrote that the children: “keep time to rhythmic music” (p. 26) such as marching to a piano tune “over and over again” (p. 22). She said exercises were introduced “in which the little ones sing in time to the rhythmic movement of their feet” (p. 25). Other rhythmic activities that were provided to children (who in some schools such as the school on the via Guisti which was set up for survivors of the Messina earthquake were nearly all trauma-affected children) were called Montessori practical life exercises. These included activities that invited repetitious and rhythmic movements such as sweeping courtyards, raking leaves, digging soil, moving to rhythmic music, walking heel-to-toe on a chalk line, modeling with clay, working with cylinder blocks, and sequential cubes, all of which required patterned, repetitive movements (Montessori, 1936).

### ***Sub-theme 2: Patterned exercises and activities***

One early eyewitness commenting on the calm that arose in the children when they worked with the Montessori sensorial materials which all involve repeating patterns of actions, (e.g., matching two identical colour tablets by using the sense of sight, matching two identical sounds by using the sense of hearing, matching two similar fabrics by using the sense of touch, matching two similar qualities, e.g. sweet, sour, salty, etc. by using the sense of taste), stated – “Nervousness gives way to tranquility. The happy tranquility to which children come after a few weeks of independent work with sense-training exercises is perhaps the most notable

feature” (George, 1912, p. 26). Many other Montessori exercises involve *patterned* activity (Phillips, 2022).

### ***Sub-theme 3: Repetitive exercises and activities***

Montessori wrote, “*I noted a peculiar behaviour that was common to all, and practically the rule in all they did – which I later called - “repetition of the exercise”* (Montessori, 1936, p. 127). For example, she described a child of about three years who repeated an exercise (involving putting cylinders in and out of holes in a wooden block) forty-two times (Montessori, 1936, p, 127). Crucially, Montessori noticed that following these repetitive exercises, children became calm and serene. For example, this child (when she suddenly ended the exercise after forty two rounds, showed by her facial expression that she was calm and anxiety free – “She smiled as if she were very happy” and “Her eyes shone” (Montessori, 1936, p.127). It was at this point that Montessori began to recognise the effectiveness of what Perry would later refer to as “patterned, repetitive, rhythmic activities” (Perry, 2009, p. 252) in moving a child from a high anxiety state to a calmer more cognitive state, simply because such activities are rhythmic and rhythm regulates the dysregulated brain (Perry, 2009).

This paper suggests that Montessori augmented the power of these activities to provide repetitive neural input to the brainstem by offering them to children when they were under the influence of the sensitive period for movement, which Montessori saw as being most acute between birth and 5 years and was characterized by an urge to *repeat* the same physical movements over and over, e.g. opening and closing buttons, tying and untying lace frames, filling and then emptying buckets or wheelbarrows using soil or sand (Montessori, 1936). Montessori’s and other eyewitness’s comments on the children would suggest that the repetitive activities (described above) helped to reduce anxiety in these trauma-affected

children and brought regulation (Montessori, 1936; Bailey, 1915). We now understand from Perry's work the science behind this - because as Perry states "interventions that provide patterned, repetitive, neural input to the brainstem... would be organising and regulating input that would likely diminish anxiety" (Perry, 2009, p. 243). It is therefore reasonable to state that Montessori's approach (i.e. providing repetitive, rhythmic activities) aligns with the neuroscientific principle of specificity. In this case, since many of the children were trauma-affected, there was a need to target the brain stem where the dysregulation is centred (Perry, 2009, MacKinnon, 2012) The need to provide *repetitive* neural input to the brain stem was facilitated by the fact that Montessori deliberately offered these activities to children when they were going through a sensitive period for movement which is characterised by a compulsion to *repeat* exercises (Montessori, 1936). Montessori claimed that "we ourselves, in our schools and by observing the life of children in their families, were the first to discover the sensitive periods of infancy, and to respond to them from the standpoint of education" (Montessori, 1936, p.35). One of the early eyewitnesses to Montessori's early schools, Ellen Yale Stevens, the most experienced and respected authority on early childhood education at that time, appeared to understand that Montessori was attempting to use (an early understanding of) neuroplasticity to help to modify the brain functioning of the children in her care, because she stated categorically that Montessori "realises the plasticity of the nervous system and the importance of building into its tissues" (Stevens, 1912, p. 81). Although it is arguable that Montessori may not have fully understood (as neuroscientists now understand), the neuroscientific principles behind *why* repetitive, rhythmic movements calm the brain, this does not change the fact that her promotion of activities that use repetitive rhythmic actions reduced anxiety in the trauma-affected children she worked with and calmed them. In this respect, her approach aligns with the first of the 3Rs – *regulate*.



## **The intentional provision of *relational* richness in early Montessori schools**

The second theme identified from the analysis, relates to the intentional provision of *relational* richness in early Montessori schools. This theme contains three sub-themes – (a) A New Kind of Teacher, (b) Mixed Age Groups, and (c) Peer-teaching.

From the outset of her work with children, most of whom had been exposed to some level of adversity and or trauma, Montessori understood the need to make children feel physically and psychologically safe by *relating* to them with gentleness, kindness, and genuine love. Describing her approach with the first group of (partly homeless) mentally challenged and trauma-affected children she worked with, she said, “When these children from the streets and from the asylums entered my schools they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first time they were made to feel that they were wanted and desired” (Montessori, 2008, p. 264). She utilized three factors in her schools which created and maintained a rich *relational* environment, these factors were – a new kind of teacher, mixed age groups, and peer teaching.

### ***Sub-theme: A New Kind of Teacher***

At the outset of her career in education, Montessori made it clear that she was advocating for a new type of education with a non-traditional, new type of teacher, and she stated overtly that this new type of teacher would give priority to the *relational* aspect of teaching. She stated, “what really makes a teacher is love for the human child” (Montessori, 1913, p. 34). Montessori’s early emphasis on the importance of love in any effort to aid the development and subsequent education of children, especially trauma-affected children, owes much to the profound influence on her thinking of the works of her predecessor, Dr. Eduoard Seguin (1812-1880), who influenced Montessori’s understanding of the vital importance of love and positive relationships in child development and human flourishing (Montessori,

1967). Seguin believed that “*affection*” could be taught just as anything else could be taught, he wrote, “To develop their sense of affection ... does not demand new instruments ... but the extension of the same action upon their feelings” (Seguin, 1866, p. 244). In other words, if you want children to *learn* how to love, you must love them first and Seguin and later Montessori believed that teachers were in a unique position to do this first, by being loving, kind and relational towards their students, and second, by integrating into the curriculum exercises that literally teach children how to relate to others and be kind and loving. Seguin and Montessori’s understanding that affection can be taught anticipates Perry’s statement that the principle of “specificity” applies to all brain mediated functions, including the capacity to love. Perry writes - “If you have never been loved, the neural networks that allow humans to love will be undeveloped ... given love, the unloved can become loving” (Perry & Winfrey, 2021, p. 74). Modern neuroscience therefore confirms Seguin’s and later Montessori’s belief that “*affection*” or positive relational interactions can be taught. In order to help children to *learn* how to relate positively to others, (which we now understand actually means developing the ‘neural networks’ that allow humans to love), Montessori devised specific activities known (now rather quaintly) as exercises of Grace and Courtesy. These exercises which were essentially ‘mini-dramas’ involving role-play (e.g., how to wait, take turns, or resolve a disagreement) were designed to promote social and emotional learning (SEL) and were effective in helping children, especially trauma-affected children to learn to relate to others. This paper suggests that Montessori augmented the power of these activities to provide repetitive neural input to the brain by offering them to children when they were under the influence of a sensitive period for the social aspects of life which Montessori saw as being most active between 2 and 6 years and was characterized by an acute attunement to how people treat each other socially, coupled with an urge to repeat words and actions that represent positive social behaviors. For example, children in this age group like to say ‘hello’, ‘bye’, ‘thank you’, and in Montessori classrooms

they enjoy ‘role-playing’ and acting out the Montessori exercises or ‘mini-dramas’ referred to above. These exercises enable a child to *embody* kindness, respect, and love towards others. The exercises apparently (because of their repetitious nature) have the effect of developing the neural networks involved in social and emotional learning, and ultimately have the effect of helping children to learn how to have positive relational interactions with both their peers and their teachers (Phillips, 2022). Since, research shows that “positive relational interactions” are healing for trauma-affected children (Ludy-Dobson & Perry, 2010, p. 27), it is certainly likely that “positive relational interactions” (p. 27), intentionally promoted by the “new type of teacher”, through carefully devised exercises in the early Montessori classrooms would have played a major role in the healing process for the trauma-affected children that Montessori worked with in the decade 1907 to 1917. It is also arguable that these same exercises can still contribute to the promotion of “positive relational interactions” in contemporary Montessori schools.

### ***Sub-theme 2: Mixed Age Groups***

From the outset of her work with children Montessori had mixed age-groups in her classes and she was quick to observe the benefits of this arrangement from the point of view of what is now called relational neurobiology. She said “What matters is to mix the ages. Our schools show that children of different ages help one another” (Montessori, 1967, p. 226). She further stated that “To segregate by age is one of the cruelest and most inhuman things one can do” (Montessori, 1967, p. 226). She added that it is “a fundamental mistake” because it “impedes the development of the social sense” (p. 226). The mixture of ages in the early Montessori schools clearly promoted a feeling of connectedness and kinship (Montessori, 1967). Feeling connected has been shown to be healing for trauma-affected children because it helps to offset the feeling of being “disconnected or separate from others” frequently felt by

children who have been exposed to trauma (Craig, 2016, p. 82). Montessori pointed out that the mixture of ages in some of her schools has the potential to span several years. She wrote - “The classroom for those of three to six is not even rigidly separated from that of the children from seven to nine ... Our dividing walls are only waist high partitions, and there is always easy access from one classroom to the next” (Montessori, 1967, p. 227). She adds that children are free to go in and out of these adjoining classrooms. As a consequence, children spend time in an environment that is more like a typical family with siblings of differing ages, different abilities, and preferences, all held together by a sense of belonging and kinship. This arrangement is, according to Montessori respectful of our biological need as human beings to live in communities and collaborate with others (Montessori, 1967).

Ervin and colleagues, 2016, explain that ‘Up until the beginning of the 20<sup>th</sup> century American public schools were primarily one-room schoolhouses in which a single teacher taught all levels, but as rural agrarian society shifted to a largely urban, industrialized model, our schools changed as well. The model for these changes was the same factory model which had transformed our economy’ (Ervin et al., 2016, p. 1). However, they point out that in Montessori schools, “this trend toward single grade education was not adopted” (Ervin et al., 2016, p. 1) and they elucidate the many cognitive, social, and pedagogical advantages of multi-age classrooms. From the point of view of creating a rich relational milieu for children, especially those affected by trauma, the Montessori model appears to be a unique educational model because it is biologically respectful of the needs of human beings in the course of development.

### ***Sub-theme 3: Peer Teaching***

Dr. Montessori was quick to recognize the value of peer-teaching from a relational point of view. She wrote “a child of three will take an interest in what a five-year-old is doing, since

it is not far removed from his own powers” (Montessori, 1967, p. 226). She describes the positive aspects of this for both the older and the younger child - “All the older ones become heroes and teachers, and the tinies are their admirers” (p. 226). She explains the details of how the partnership works - “These look to the former for inspiration, then go on with their work” (Montessori, 1967, p. 226). She commented on the traditional school’s lack of understanding of what we would now refer to as relational neuroscience and how their structure causes them to miss out on opportunities for social development in children. She said, “in the other kind of school, where children in the same class are all of the same age, the more intelligent could easily teach the others, but this is hardly ever allowed” (p. 226). She adds “The only thing they may do is to answer the teacher’s questions when the less intelligent cannot” (p. 226). She points out that the outcome of this practice is often a negative one – “The result is that their cleverness often provokes envy” (p. 226). By comparison, she points out that in the Montessori schools, positive and uplifting attributes begin to develop and flourish - “in our schools the five-year-old feels himself a protector of the younger one” and she adds “It is hard to believe how deep this atmosphere of protection and admiration becomes in practice” (p.227). She says that this leads to real bonding among the classmates – “The class gets to be a group cemented by affection” (p. 227). These three factors, a new kind of teacher, mixed age groups, and peer teaching, all contributed to creating rich relational environments in Montessori’s schools. In this respect, Montessori’s approach aligns with the second of the 3Rs – *relate*.

### **The Biologically Respectful Approach to *Reason* in Early Montessori Schools**

The third and final theme relates to Montessori’s understanding that children are neurobiologically unable rather than simply unwilling to ‘reason’ when they are distressed or dysregulated and it is therefore useless to try to reason with them or try to make them learn when they are in this state. This theme contains two sub-themes – (1) Children are biologically

unable to *reason* when they are distressed, and (2) Children can use *reason* when they have become regulated and can relate to even one emotionally attuned adult.

***Sub-theme 1: Children Are Biologically Unable to Reason When they are Distressed***

In her book, *The Secret of Childhood*, (1936), Montessori vividly describes children who because of distress show an inability to reason or have any type of cortical engagement with others. She said, “A kind of curtain comes down over the child’s mind, making him psychologically evermore deaf and blind” (Montessori, 1936, p.166). She understood that this is not a conscious response, on the child’s part, it is something he/she has no control over. She said it is “a psychic defense wholly outside the domain of the will” (p. 167). She understood that this state of mind prevents a child from being able to respond to anyone’s attempts to get through to him using logic or reasoning. She said, “it represents a subconscious impediment to the reception, and hence to the comprehension, of ideas imposed from without” (p. 166). She added “It is as though the subconscious mind were to say: you speak, but I am not listening; you repeat things, but I do not hear you” (p.167). She says that a child in this state “does not possess his mind” (p.166). In a later book, she advised that when this state of mind is present “It does not help to reason with the children” (Montessori, 1967, p. 202). These comments, written many years ago show Montessori’s biologically respectful approach to human development. Stevens, a child development expert and eyewitness to Montessori’s early schools stated, “I think she can claim to be the first one to give the world a rational theory of education based upon true biological, anthropological and sociological laws” (Stevens, 1913, p. 19). Montessori’s comments convey an understanding strikingly similar to Perry’s explanation of how the cortex “goes off-line” when a child is deeply distressed and in a state of hyper or hypo-arousal (Perry & Graner, 2018). Perry explains that when children are in a dysregulated state of mind, they cannot access their cortex to give rational consideration or

rational answers to those trying to reason with them. The cortex is temporarily ‘shut down’ during these times of distress therefore reasoning is not possible, until *regulate* and *relate* have done their job and the child has reached a state of homeostasis or internal stability (Perry, 2009). This also means that a child in a state of dysregulation cannot learn and even the best of teachers cannot get to their cortex. The most serious consequence of this fact is that a child in a state of dysregulation “can sit in a classroom and not learn” (Perry, 1999, p.10; 2002, p. 11). These children often are referred to as being “learning disabled” (Perry, 1999, p. 10).

***Subtheme 2: Children Can Use Reason When They Have Become Regulated and can Relate.***

Montessori’s first educational work was with children who were regarded as being uneducable (Montessori, 2008). They were expelled from their schools because they could not learn (Montessori, 1912/1964). Yet when Montessori began to work with them and gave them activities which helped them to become regulated (Montessori, 1912/1964), and provided continuous doses of positive, relational interactions (Montessori, 2008), these so called ‘uneducable’ children suddenly learned to read and write and actually passed their state examinations, making Montessori look like a ‘wonder-worker’ (Montessori, 1912/1964; Tozier, 1911). It is clear that with Montessori’s provision of regulatory activities, and a rich relational environment, these children moved successfully through a cycle fundamentally similar to the NME ‘s Sequence of engagement - ‘regulate, relate and reason’ and ultimately, they were able to access their cortical brain, and were able to learn. The story was the same for the impoverished San Lorenzo children, the numbed, terrified children who survived the Messina earthquake and the French and Belgian child refugees, who were traumatised from exposure to war. Most of these children, many of whom, at first, appeared to be learning disabled, showed extraordinary emotional, social, and cognitive development, and even learned to write and then read at an extraordinary speed, when given regulatory exercises and activities

and were related to with kindness and love (Tozier, 1911). This sudden onset of academic abilities which hitherto had appeared to be non-existent, demonstrated to Montessori that children can access their cognitive abilities when they first become regulated and second are supported in the development of positive relationships (Montessori, 1912/1964; 1936). In this respect, her approach aligns with the third of the 3Rs – *reason*.

### **Discussion**

This paper offers an important original contribution to knowledge in that it asks the question “Does the Montessori approach to healing trauma-affected children align with the *Regulate, Relate and Reason* phase of the NME?” and it finds, through thematic analysis, that there is a significant alignment between the two models. This is important because currently, trauma related problems in children are widespread and there is a need for the intentional creation of strategies to support trauma-affected children in schools. Recent events remind us that human beings, despite all our advances are still prey to wars, natural disasters and pandemics, and the inevitable trauma that arises from this. Maria Montessori lived through two world wars, a flu pandemic, and other turmoils. This paper shows that the original Montessori approach was from its inception, a model that recognized the realities of human life and so developed an approach that supports children to *regulate* their emotions when they are triggered by trauma or memories of past traumatic events; *relate* with emotionally attuned adults and with other children when they have calmed down; and consequently be enabled to use *reason* and use other higher level functions that are mediated by the cortex, such as memory, speech and language in order to learn while in school. The paper also shows that historically, using this approach, Montessori enabled large numbers of children who were labelled unteachable to pass their State Examinations, (Montessori, 1912/1964) and hundreds of independent visitors to her schools witnessed the emotional, social, and cognitive



transformation of impoverished and neglected children, as well as children traumatised by wars and natural disasters, through her approach (Bailey, 1015; Cromwell, 1916; Fisher, 1912; George, 1911). These facts are made all the more important by the evidence contained in this study showing that Montessori's approach aligns with the neuroscientific principles undergirding the NME, especially the principle of 'specificity' (Perry & Ablon, 2019). This paper suggests that this evidence could be empowering for thousands of Montessori educators globally, who are increasingly facing the task of supporting trauma-affected children, because it provides further scientific backing for the uniqueness of the Montessori model and may enhance their professional practice and confidence, giving them a 'head-start' in relation to their ability to support trauma-affected children. Essentially, the study shows that the Montessori model embodies a framework very similar to the neurobiologically respectful NME (3Rs) framework which has been shown to be remarkably successful in helping teachers to calm, relate to and enable cognitive functioning (i.e., reason) with children have been affected by traumatic experience (Perry & Graner, 2018). This paper suggests that contemporary Montessori schools therefore already have the built-in infrastructure to provide trauma-affected children with neurobiologically-based strategies to help them. This infrastructure consists firstly of a curriculum that encourages the use of regulatory exercises and materials, freely available at all times to the children, so that the children can regulate themselves as needed. This includes offering materials and activities that provoke repetition which is so necessary to provide repetitive neural input to the brainstem in order to reduce anxiety (Perry, 2009). Secondly, this infrastructure consists of a relationally rich environment (the school itself) which provides (a) a new kind of teacher who is trained to understand the biological importance of love and positive relational interactions for human flourishing (Montessori, 1913); (b) mixed age groups, which promote a sense of kinship, family, belonging and community within which children are accepted and loved, (Montessori, 2008), which contemporary research shows is

vitaly important to all children but especially to those who have been affected by trauma (Treisman, 2017), and (c) peer teaching as a normal part of the learning process. Peer teaching may help trauma-affected children to find their strengths, e.g., helping younger children with tasks. Thirdly, this infrastructure consists of a biologically respectful understanding of children's inability rather than unwillingness to use reason when they are in a distressed state, or access certain brain functions such as memory and executive functions that are mediated by the cortex and are vital for learning (Perry, 1999) while in this state. This biologically respectful approach in Montessori means that teachers understand *why* children find it impossible, when in a state of dysregulation, to apply themselves to academic tasks and realise that such states are frequently caused by triggers of past trauma, and thus they leave children incapable of rational thoughts and unable to find sensible solutions to problems or disagreements.

The findings outlined in this paper are important firstly for theory, in that they show how the Montessori approach is aligned with the 3Rs of the NME and how Montessori (intentionally or otherwise) utilized the principle of 'specificity' and so provided neural input to the dysregulated brainstems of the trauma-affected children she worked with and witnessed firsthand the consequent reduction in anxiety, and stress in these children. Secondly, the findings are important for practice in that they provide contemporary Montessori schools with the knowledge that they may have a unique advantage in that they already have the infrastructure in place to apply themselves to the intentional and deliberate creation of trauma-informed practice in their schools. Thirdly, the findings are important for other researchers who may wish to test the Montessori approach to supporting trauma-affected children in contemporary Montessori schools using, for example, large scale mixed methods research and follow up assessments. Further research in this area may go a long way to improving the lives of children enduring the effects of traumatic experience which sadly, but realistically, is a fact of human life.

## References

- Babini, V., & Lama, L. (2000). *Una Donna Nuova: Il Femminismo scientifico di Maria Montessori*. Milano, Italy: Franco Angeli.
- Boyd, W. (1917). *From Locke to Montessori: A critical account of the Montessori point of view*. Harrap & Company.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Braun, V., & Clarke, V. (2022). *Thematic Analysis: A Practical Guide*. SAGE.
- Burke Harris, N. (2019). *The deepest well: Healing the long-term effects of childhood adversity*. Marine Books.
- Craig, S. E. (2016). *Trauma-Sensitive Schools: Learning Communities Transforming Children's lives, K-5*. Teachers College Press.
- Debs, M. 2023. "Global Montessori Education", pp. 283-289. In Murray, Angela, Eva-Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. 2023. *The Bloomsbury Handbook of Montessori Education*. Bloomsbury Publishing.
- Debs, M. (2019). *Diverse families, desirable schools: public Montessori in the era of school choice*. Harvard Education Press.
- De Stefano, C. (2022). *The Child is the Teacher*. Other Press.
- Erwin et al., (2016). *Examining the Literature on Authentic Montessori Practices: Multi-Age Groupings*. AMS. Research Committee White Paper.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)

- Foschi, R. (2008). Science and culture around the Montessori's first "Children's Houses" in Rome (1907–1915). *Journal of the History of the Behavioral Sciences*, 44(3), 238–257. <https://doi.org/10.1002/jhbs.20313>
- Gutek, G., & Gutek, P. (2017). *Bringing Montessori to America: S.S. McClure, Maria Montessori, and the campaign to publicize Montessori education*. University of Alabama Press.
- Kramer, R. (1976). *Maria Montessori: A biography*. Addison-Wesley.
- Ludy-Dobson, C., & Perry, B. (2010). The Role of Healthy Relational Interactions in Buffering the Impact of Childhood Trauma. In E. Gil (Ed.) *Working with Children to Heal Interpersonal Trauma: The Power of Play*. The Guilford Press.
- MacKinnon, L. (2012). The Neurosequential Model of Therapeutics: An Interview with Bruce Perry. *The Australian and New Zealand Journal of Family Therapy* 33(3), 210-218. <https://doi.org/10.1017/aft.2012.26>
- Mc Sherry, D. (2021). A New Vision for the Journal of Child and Adolescent Trauma. *Journal of Child and Adolescent Trauma*. 14:1-3 <https://doi.org/10.1007/s40653-021-00347-z>
- Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the Measurement of Adversity. *Child maltreatment*, 22(1), 58–68.  
<https://doi.org/10.1177/1077559516679513>
- Montessori, M. (1913). *Pedagogical Anthropology*. Frederick A. Stokes Company.
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. and Trans.). Longmans.
- Montessori, M. (1966). *The Secret of Childhood*. (M. J. Costello, Trans). Ballantine.
- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books.  
(Original work published 1912)

- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans). Dell. (Original work published 1949)
- Montessori, M. (1975). *The Formation of Man*. (Trans. by A.M. Joosten) Kalakshetra Publications. (Original work published 1949).
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series. Montessori-Pierson.
- Montessori, M. (2012). *The 1946 London Lectures by Maria Montessori*. (Dr. Annette Haines Ed.). Montessori-Pierson.
- National Child Traumatic Stress Network, (2020).
- Perry, B. D. (2006). The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children. In N.B. Webb (Ed.) *Working with traumatized youth in child welfare* (pp. 27 – 52). The Guilford Press.
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–245. <https://doi.org/10.1080/15325020903004350>  
[https://doi.org/10.1002/1097-0355\(199524\)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B](https://doi.org/10.1002/1097-0355(199524)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B)
- Perry, B.D., Graner, S. (2018). *The Neurosequential Model in Education: Introduction to the NME Series: Trainer’s Guide (NME Training Guide)*. Child Trauma Academy Press.
- Perry, B. D., & Hambrick, E. P. (2008). The Neurosequential Model of Therapeutics. *Reclaiming Children and Youth*. Vol 17 (3).

- Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook - what traumatized children can teach us about loss, love, and healing*. Basic books.
- Perry, B.D., Ablon, J.S. (2019). CPS as a Neurodevelopmentally Sensitive and Trauma-Informed Approach. In: Pollastri, A., Ablon, J., Hone, M. (eds) Collaborative Problem Solving. Current Clinical Psychiatry. Springer, Cham. [https://doi.org/10.1007/978-3-030-12630-8\\_2](https://doi.org/10.1007/978-3-030-12630-8_2)
- Perry, B. D., & Winfrey, O. (2021). *What Happened To You? Conversations on trauma, resilience, and healing*. Pan Macmillan.
- Phillips, B., O'Toole, C., McGilloway, S., & Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. *Journal of Montessori Research*. Vol 8, Issue (1).
- Seguin, E. (1866). *Idiocy and its Treatment by the Physiological Method*. William Wood & Co.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, 40, 77–82.
- Stevens, E. Y. (1913). *A Guide to the Montessori Method*. Frederick Stokes Company.
- Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. SAMHSA's Trauma and Justice Strategic Initiative  
[https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf)
- The Neurosequential Network, [www.neurosequential.com](http://www.neurosequential.com)

Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori.

*McClure's Magazine*, 37(1), 3–19.

van der Kolk, B. (2014). *The body keeps the score: Mind, brain and body in the*

*transformation of trauma*. Penguin.

## CHAPTER 6

### **Commonalities between the Neurosequential Model in Education (NME) and Montessori.**

#### **(Study 2)**

This chapter presents the paper: “The Montessori Method and the Neurosequential Model in Education (NME): A comparative study” which has been published in the *Journal of Montessori Research* as cited below.

Phillips, B. (2022). The Montessori Method and the Neurosequential Model (NME): A Comparative Study. *Journal of Montessori Research*. Vol. 8 Issue (2). 33-43  
<https://doi.org/10.17161.jomr.v8i2.18419>

This paper is based on additional findings from Study 2, which integrated information from Study 1 with contemporary literature on trauma and trauma-informed practice to develop an innovative programme of continuing professional development (CPD) designed to enhance the capacities of early childhood teachers to support trauma-affected children. Study 2 was conducted by the researcher to answer the second research question: “Can historical and contemporary evidence be appraised and integrated to develop a robust CPD programme of Montessori-attuned, trauma informed practice?”



**The Montessori Method and the Neurosequential Model in Education (NME):**

**A comparative study**

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### **Abstract**

The Neurosequential Model in Education (NME) is described as a developmentally sensitive and biologically respectful approach to development and learning. This paper postulates that the NME shares many commonalities with the Montessori Method in that it, too, is developmentally sensitive and adheres to biologically respectful concepts. This paper compares some of the core principles and recommended practices of the NME with those in the Montessori Method and argues that they are consistent in many ways. The paper also examines Dr. Montessori's unique use of "sensitive periods" in development for educational purposes, in particular her use of the sensitive periods for movement, the social aspects of life and the sensitive period for order respectively. It argues that in doing this she was actively promoting an approach to human development and education that appears to correlate with what Dr. Bruce Perry calls a developmentally sensitive and biologically respectful approach to learning. The goal of this study is to show the science behind why many of Dr. Montessori's original practices worked and had such a positive effect on children. This knowledge should empower Montessori educators and give them the confidence to promote authentic Montessori practices in the knowledge that they are in line with current neuroscientific theories that have been shown to be beneficial to children.

**Keywords:** *Montessori Method, Neurosequential Model in Education (NME), sensitive periods in development, neuroscience and Montessori*

*Is Montessori a genius? Is her book a real contribution to educational thought? Has her method something in it vital and universal?* (Stevens, 1912, p. 78)

Maria Montessori (1870–1952) could well be described as a brain scientist ahead of her time. She became a medical doctor in 1896 and specialized in psychiatric conditions in children (Babini, 2000). She then turned her attention to education and human development (Babini & Lama, 2000; De Stefano, 2022; Kramer, 1976; Standing, 1957). In the above quotation, the book Stevens refers to is Dr. Montessori’s seminal publication, which has been known as “The Montessori Method” since it was first translated into English in 1912. However, when Dr. Montessori first published this book in Italian in 1909, she gave it the title, “*Il Metodo della Pedagogia Scientifica applicato all’educazione infantile nelle Case dei Bambini,*” which means in English, “The Method of Scientific Pedagogy Applied to the Education of Young Children in the Children’s Houses.” Historically, “Scientific Pedagogy” was what the Montessori Method was all about.

The Neurosequential Model in Education (NME) was developed by and is based on the work of the neuroscientist and child psychiatrist Dr. Bruce Perry. The NME is a non-therapeutic adaption of the Neurosequential Model of Therapeutics (NMT), also developed by Perry. The NMT, which started out as a purely clinical approach related to Perry’s work, is an approach that incorporates key principles of neurodevelopment into the clinical problem-solving process. Perry describes it as “developmentally sensitive, neurobiology-guided practice” (Perry, 2009, p. 248). The NME, on the other hand is non-therapeutic. Perry describes it as “a developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a). The NME has universal application across the entire spectrum of children but is especially beneficial to children with developmental problems. The NME is a “train the trainer” model in which teachers (often school principals) are trained in the NME

and then pass that training on to other teachers in their school or district. The goal of the training is not to turn teachers into therapists, neuroscientists, or psychologists; rather, the training guides teachers in identifying the child’s primary developmental problems and then aids them in developing a rehabilitative plan that helps to reduce difficult behaviors and increase the child’s ability to engage successfully in developmentally appropriate educational activities.

This paper compares some of the core principles and recommended practices of the NME with those in the Montessori Method and outlines the shared features of the two models and shows how Dr. Montessori’s early work anticipated many current principles in neuroscience. It also examines Dr. Montessori’s unique use of “sensitive periods” in development for educational purposes (in particular, her use of the sensitive periods for movement, the social aspects of life, and order, respectively and argues that, in utilizing the sensitive periods for educational purposes, she was actively promoting an approach to human development and education that appears to correlate with what Perry calls a “developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a).

### **Method**

This paper compares some of the neuroscientific principles of the NME with practices in the Montessori Method to shed more light on the science behind Dr. Montessori’s success with children. To do this, the author conducted an analysis of available sources on the NME. These sources comprised of books, articles, interviews, seminars, YouTube webinars, and online courses relating to the NME. In addition, the author conducted an analysis of four of Dr. Montessori’s seminal books—*The Montessori Method* (1912/1964), *The Secret of Childhood* (1936), *The Absorbent Mind* (1949/1967), and *The Formation of Man*, (1949/1975)—and her pamphlet, *The Four Planes of Education* (1971, from a lecture delivered in 1938). These five publications were selected because they are generally recognized as reliable sources of Dr.

Montessori's core concepts. Additionally, an analysis of Jean Marc Gaspard Itard's (1802) book, *An Historical Account of the Discovery and Education of a Savage Man*, and Édouard Séguin's (1866) book, *Idiocy and Its Treatment by the Physiological Method*, was also conducted because Dr. Montessori repeatedly stated that her work builds on the work of Itard and Séguin. These combined sources yielded a large amount of data. Braun and Clarke's analytical model on thematic analysis was used (Braun & Clarke, 2006, 2022). Specifically, the literature was examined, coded, and categorized into themes. Subsequently, the theoretical concepts (as outlined in the theoretical framework below) shaped the final identified themes.

### **Theoretical Framework**

This study is centered on the concept of offering children a developmentally sensitive and biologically respectful education as expounded by Bruce Perry in his Neurosequential Model of Education. It is also centered on Dr. Montessori's own original concept of providing children with a developmentally sensitive and biologically respectful education, which includes her utilization of "sensitive periods" in human development from the standpoint of education, as expounded in her seminal publications listed above.

### **Results**

The analysis identified three major themes: (a) The 6 R's of the NME, (b) How the 6 R's of the NME align with the Montessori Method, and (c) How Dr. Montessori utilized sensitive periods in development to provide children with an educational approach that anticipates what Perry calls a "developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a). We now review each theme.

## **The 6 R's of the Neurosequential Model in Education**

The first theme identified from the analysis relates to the “6 R's” of the NME. In an NME classroom, there is an adherence to 6 R's. This means that the classes try to be the following:

- 1) Relational (promoting a sense of kinship and safety). NME educators are trained to build quality human relationships with their students, especially with the students who present the most challenges, because “Positive relational interactions” have been shown to promote “healthy development” in children (Ludy-Dobson & Perry, 2010, p. 27). For children who have been emotionally damaged, Perry and Szalavitz (2017) argue that “The more healthy relationships a child has, the more likely he will be to recover from trauma and thrive. Relationships are the agents of change, and the most powerful therapy is human love” (p. 258). Perry emphasizes “the primacy of human connectedness,” the power of “connectedness and belonging” (Perry & Winfrey, 2021, pp. 270, 249), and the importance of community, (ThinkTVPBS, 2020c).
- 2) Rhythmic (resonant with neural patterns). NME educators are trained to utilize rhythm in their classes (e.g., walking, music and movement sessions, dancing, balancing exercises, yoga, drumming sessions, and group singing), because such activities “would be organizing and regulating input that would likely diminish anxiety, impulsivity” (Perry, 2009, p. 243).
- 3) Repetitive (having repeating patterns). NME educators are taught that the brain only changes through “patterned, repetitive activation” (Perry, 2009, p. 244). Educational content, therefore, should be offered as creatively as possible keeping this core concept of repetition in mind.

- 4) Relevant (developmentally matched to the child). NME educators are trained to be aware of the varying developmental levels of their students so they can offer content that is appropriate to the students' level of comprehension (ThinkTVPBS, 2020e).
- 5) Rewarding (giving pleasure). NME educators are trained to keep at the forefront of their minds their student's need for success, knowing that the pleasure of learning something new will naturally lead to the desire to learn more (ThinkTVPBS, 2020e).
- 6) Respectful (of the children, their culture, and their immediate and extended families). NME educators are trained to respect the diverse cultural backgrounds of students and their families and to use these backgrounds as a springboard to learning (ThinkTVPBS, 2020a).

### **How the 6 R's of the NME compare with the Montessori Method**

The second theme identified from the analysis of the literature relates to how the 6 R's of the NME align with the Montessori Method. As stated above, in an NME classroom, the 6 R's mean that the classes need to be relational, rhythmic, repetitive, relevant, rewarding, and respectful. In this regard, there is much commonality between the NME and the Montessori Method.

Firstly, an analysis of the literature selected and scrutinized for the purposes of this study shows that there is a strong commonality between the "relational" aspect of an NME classroom and the "relational" approach advocated by Dr. Montessori in her method. As early as 1897, when Dr. Montessori began to work with mentally challenged children, she realized the importance of positive, relational interactions between teachers and children. When describing her work with these children, she wrote,

*When these children from the streets and from the asylum entered my school they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first*

*time they were made to feel that they were wanted and desired.* (Montessori, 2008, p. 264)

She went on to describe how these children flourished emotionally, socially, and cognitively, even managing to pass the Italian State exams, much to the amazement of the public. Moreover, as early as 1904 in her lectures at the University of Rome (which later became the main content of Dr. Montessori's 1913 publication *Pedagogical Anthropology*), Dr. Montessori stated, "What really makes a teacher is love for the human child" (Montessori, 1913, p. 34). She also recognized the power of love as a force for human flourishing. She wrote: "This force that we call love is the greatest energy of the universe" (Montessori, 1967, p. 290). She asks: "Why should it not always be a subject for study and analysis, so that its power can become beneficent?" (Montessori, 1967, p. 290). She writes: "Every contribution able to bring out the latent power of love, and to throw light upon love itself, should be welcomed with avidity and considered of paramount importance" (Montessori, 1967, p. 290).

Dr. Montessori also recognized the fundamental importance of community and having a sense of belonging. In a rare Montessori article based on a lecture she delivered in Kodaikanal, India, in 1944, she stated, "In English, there is the famous sentimental expression 'Home! Sweet home!' For the adult, the idea of home rings with similar satisfactory notes. But where is the child to find an answer to his need? In the 'House of Children', we endeavor to give to the child the relief of feeling, for once, 'at home'" (Montessori, 2013, p. 11). In another publication, she repeatedly stated that her schools were not *houses* of children but rather *homes* for children with all the warmth, love, and sense of belonging that a good home signifies (Montessori, 1967). She made her schools into little communities where children felt they were useful, welcomed, and loved members of a social group (Montessori, 2008, p. 264), and they showed evidence in their social, emotional, and behavioral growth that they were flourishing as human beings (Montessori, 1964, 1936). These statements by Dr. Montessori (and there are



many more) resonate strongly with what Perry has discovered about the healing power of love and the need for schools to be relational. Also, Perry, in agreement with Dr. Montessori, states that “the most powerful therapy is human love” (Perry & Szalavitz, 2017, p. 258).

Secondly, Montessori and Perry express similar views about the need for schools to make use of rhythmic exercises and activities. As far back as 1897, when she first worked with mentally challenged children, Dr. Montessori recognized the importance of rhythmic activities to calm the brain. Following and surpassing her predecessor Séguin, she made use of what Perry calls “patterned repetitive rhythmic activities” (Perry, 2009, p. 243). These take the form of rhythmic practical life activities (such as sweeping, scrubbing, dusting, pouring, spooning, buttoning), sensorial activities (cylinder blocks), cultural activities (movement to rhythmic music), pre-writing activities (the rhythmic movements involved in the insets for design and “metal insets”), mathematical activities (the rhythmic movements involved in feeling sandpaper numbers and the patterned movements involved in matching cards and counters), language activities (the rhythmic movements involved in feeling the shapes of sandpaper letters). Many early eyewitnesses to Montessori schools commented at length on the rhythmic aspect of the curriculum (see Phillips et al., 2022).

Thirdly, regarding the need for schools to make use of repetition in their exercises and activities, Dr. Montessori, from early on in her work, expressed her observations about the role of repetition in children’s development and learning which are similar to ideas later emphasized in the NME. For example, in 1907, when recording her initial observations in the very first Casa dei Bambini, Dr. Montessori states that “the very first phenomenon that awoke my attention” was the young child’s natural tendency to repeat exercises and activities (Montessori, 1936, p. 126). She describes her incredulity when observing a young child repeating a cylinder block forty-two times. She later observed this phenomenon in children’s other activities such as hand washing (Montessori, 1936, p. 128). She further observed that following this

“repetition of the exercise...the children emerged as rested, full of life, with the look of those who have experienced some great joy” (Montessori, 1936, p. 127). From this moment on, she encouraged her teachers to allow children to repeat an exercise as many times as they wished because she recognized that repetition had psychological significance and seemed to meet an “inner need” in the child (Montessori, 1936, p. 128).

Fourthly, Montessori and Perry both argue that schools need to be relevant—that is, developmentally matched to the child. Very early on in her work in the Casa dei Bambini, Dr. Montessori recognized the necessity of giving children free choice in their selection of activities to ensure that the activities were developmentally matched to the child. She wrote: “The children had their special preferences and chose their own occupations. To enable them to do so, we later provided low, pretty cupboards in which the apparatus was placed at the disposition of the children, who could choose what corresponded to their inner needs. Thus, the *Principle of free choice* accompanied that of *Repetition of the exercise*” (Montessori, 1936, p. 129).

Fifthly, regarding the need for schools to be rewarding—that is, to give pleasure and a feeling of success producing good chemical responses in the child, Dr. Montessori and Perry share a commonality. Dr. Montessori repeatedly observed that the children, having engaged in activities of their own choice which allowed them the possibility of success, and having been allowed to repeat these activities for as long as they wished without interruption, became happy and joyful, “their faces alert and joyous” (Montessori, 1936, p. 153).

Sixthly, regarding the need for schools to be respectful of the children, their culture, and their immediate and extended families, Dr. Montessori and Perry appear to be of the same mind. Regarding the child, Dr. Montessori wrote: “The child is truly a miraculous being, and this should be felt deeply by the educator” (Montessori, 1967, p. 121). Very early on in her

work with the children in the first Casa dei Bambini in 1907, Dr. Montessori became aware of the young child's acute sense of dignity and need for respect when she noticed how they were continuously reprimanded by adults for having "runny" noses and so decided to give them what she thought was a "humorous lesson" on how to blow one's nose discreetly. Following the lesson, the children reacted with a burst of applause (Montessori, 1936, p. 134). Dr. Montessori stated that "afterwards, through long experience, I discovered that children have a profound feeling of personal dignity.... I had indeed touched these poor little children in their social dignity" (Montessori, 1936, p. 135). Dr. Montessori extended this respect to the children's immediate and extended families by such simple things as "chatting" directly with the mothers of these children (something unheard of in her day) and instructing her teachers to have weekly meetings with the mothers so that they could discuss their children together (Montessori, 1964).

**How Dr. Montessori utilized "sensitive periods" in development to provide children with an educational approach that anticipates what Perry calls a "developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a)**

The third and final theme identified from the analysis of the literature relates to how Dr. Montessori utilized "sensitive periods" to support a developmental approach that anticipates what Perry calls a "developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a).

The concept of sensitive periods in development was first postulated in biology with regard to animal life. However, Dr. Montessori had a deep insight into the existence and importance of sensitive periods in the development of the human being. She wrote, "Man's mind does not spring from nothing; it is built up on the foundations laid by the child in his sensitive periods" and claimed to be the first to discover "the sensitive periods of infancy"

(Montessori, 1936, pp. 55, 34). She regarded sensitive periods as protective factors designed by nature to aid the optimal development of the human being. She defined sensitive periods as (a) critical periods or blocks of time in children's lives when nature directs them to focus their attention on areas that are vital to their normal development at a specific point in time; (b) temporary phases which wane and ultimately fizzle out when children have been given enough time to master the area necessary for their optimal development; and (c) windows of opportunity for learning and development because, during each of the sensitive periods, children experience an intense and extraordinary interest in the area that nature directs them to focus on, which causes them to repeat an activity until they have mastered it. Regarding sensitive periods, she wrote:

*It was the Dutch scientist Hugo de Vries, who discovered the existence of sensitive periods in animal life, but we ourselves, in our schools and by observing the life of children in their families, were the first to discover the sensitive periods of infancy, and to respond to them from the standpoint of education. These periods correspond to special sensibilities to be found in creatures in process of development; they are transitory and confined to the acquisition of a determined characteristic. Once this characteristic has evolved, the corresponding sensibility disappears. (Montessori, 1936, pp. 34–35)*

Dr. Montessori identified several sensitive periods in development during the first six years of life (Montessori, 1936). She saw the importance of making use of the sensitive periods “from the standpoint of education” (Montessori, 1936, p. 34) because she believed that children would never again experience a level of interest, concentration, or devotion to a specific area that they experienced while under the influence of its corresponding sensitive period.

## **Dr. Montessori's concept of a sensitive period for movement**

Édouard Séguin (1812–1880), a French physician who developed what he called the “Physiological Method” of education, greatly influenced Dr. Montessori. She translated word for word the lengthy French volume of his work (Séguin, 1866). For Séguin, the importance of movement and physiological exercises as a means of reaching the brain was fundamental. In explicating Séguin’s understanding of the importance of movement and muscular education, one of Dr. Montessori’s contemporaries wrote,

*The brain, the organ of the mind, is a part of the nervous system, and through this system alone can the mind of the pupil be reached. And in its turn the nervous system can be reached only through the muscles and senses; so that the education of the child must begin with the training and development of his muscular and sensorial powers.*

(Fynne, 1924, p. 145)

Séguin’s views on the importance of movement and muscular education were in accord with best twentieth-century thought. For example, in 1904, Professor Herman Horne, the American educational philosopher, wrote:

*All appeals to the mind, educational and otherwise, must be made through the agency of the nervous system. The senses on the one hand and the muscles on the other are the two first gateways through which educational influences must proceed. The educator who would climb up into the mind by some other way is unaware of the nature of the child with whom he has to deal. The training of the senses and the doing of things well that require delicacy of muscular adjustment are the two beginnings of physical education, and only a sound physical education can support a sound mental education.*

(Horne, 1904, pp. 61–62)

This paper argues that Dr. Montessori took Séguin’s principles a step further when she added to them the power of the sensitive periods in development which promote “repetition of the exercise” (Montessori, 1936, p. 126). By utilizing the sensitive periods, with their inbuilt compulsion towards repetition, as an aid to the development of the body and the mind, Dr. Montessori was clearly promoting an educational approach that shares features similar to what Perry calls a “developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a).

From her meticulous observations of young children, Dr. Montessori became convinced that, from birth to 6 years, all children experience a “Sensitive Period for Movement” (Montessori, 1936) which is most acute between birth and 5 years. She noticed that during this period, children are intensely interested in and focused on perfecting their movements; therefore, they repeat certain movements. Following these repetitive actions, they appear to become calm and “very happy” (Montessori, 1936, p. 127). To facilitate this sensitive period, Dr. Montessori designed many activities and exercises involving small and gross motor movements. These activities and exercises feature prominently in the practical life, sensorial, and cultural areas of the Montessori curriculum. They also feature in the language and math areas of the curriculum, especially in activities that utilize procedural or muscle memory—that is, a type of memory that involves committing a specific motor task into memory through repetition; for example, children learn to feel sounds/numerals by repeatedly feeling sandpaper letters/numbers and so developing a muscle memory of their shapes. In all these activities, repetition is paramount, because, as neuroscience now shows us, “interventions that provide patterned, repetitive, neural input to the brainstem...would be organizing and regulating input that would likely diminish anxiety” (Perry, 2009, p. 243).

To onlookers who knew of Dr. Montessori’s years of research, the science behind the genius was evident. One witness wrote:

*When one visits these schools the life of the children seems so normal, so natural, and their activities at first glance so undirected, that it is easy to overlook the fact that behind all this, making it possible, lie years of preparation, of scientific training, of extensive experimentation, deep and earnest thought, reverent, unprejudiced observation. Perhaps no educator has ever approached a pedagogical experiment through such broad and remarkable training. It is characteristic of Maria Montessori's peculiar genius that her gifts as a scientist, a physician and a psychologist have always been but means through which she might help more vitally the lives of those about her.* (George, 1912, p. 28).

Another eyewitness, the highly respected American Kindergarten expert Ellen Yale Stevens, wrote that Dr. Montessori “realises the plasticity of the nervous system and the importance of building into its tissues” (Stevens, 1912, p. 81). Stevens appears to be using the word plasticity as we would today—to denote the quality of being easily shaped and molded. Solange Denervaud, a neuroscientist and former Montessori educator, whose work examines the impact of the Montessori pedagogy on the neural development of the child, emphasizes the importance of neuroplasticity in childhood. Denervaud reportedly said, “brain plasticity lasts until our death. But in reality, we build our foundations during childhood” (Galitch, 2021, p. 5). By utilizing the sensitive period for movement as an educational aid, Dr. Montessori was, in effect, utilizing the brain’s capacity for neuroplasticity to the maximum.

### **Dr. Montessori’s concept of a sensitive period for the social aspects of life**

Édouard Séguin believed that social and emotional learning “affection” could be taught just as the refinement of the senses was taught:

*To develop their sense of affection ... as were developed their senses of sight, hearing, and others, does not demand new instruments, or new teachers but the extension of the same action upon their feelings. To make the child feel that he is loved, and to make him eager to love in his turn, is the end of our teaching as it has been its beginning. If we have loved our pupils, they felt it and communicated the same feeling to each other; if they have been loved, they are loving.... For our pupils.... love alone can truly socialize them; those alone who love them are their true rescuers. (Séguin, 1866, p. 244–5)*

Dr. Montessori took Séguin 's ideas about social and emotional learning and built on them. From her meticulous observations of young children, Dr. Montessori became convinced that all children (from approximately 2 to 6 years) experience a “Sensitive Period for the Social Aspects of Life” (Montessori, 1936, p. 33). During this period, children are intensely interested in and focused on how we interact with and treat other people.

This paper postulates that Dr. Montessori was (and still is) unique among educators in that she used this sensitive period in children’s lives to teach them how to show qualities like kindness, respect, and empathy by having children repeatedly act out kindness, respect, and empathy. She named these activities the Exercises of Grace and Courtesy. She also utilized specific collaborative activities, especially ones that involve movement, therefore combining the power of the sensitive period for movement with this sensitive period. For example, she encouraged and facilitated collaborative activities such as the carrying of tables, chairs, or large teaching materials out to the garden or preparing long tables for communal meals (Montessori, 1936). Similarly, through the Exercises of Grace and Courtesy, children embody the qualities of love, respect, kindness, empathy, and so on. For example, by teaching children the physical action of stepping aside to allow somebody to pass or of closing the door quietly so as not to



disturb others, we are, in effect, ingraining in the child's procedural memory the know-how of showing respect and kindness to others. The implications of this are immense.

It could be argued that we are laying the bedrock for preventing bullying in childhood, adolescence, and in the workplace in adulthood. It has already been shown that Montessori schools have significantly less "ambiguous rough play" than non-Montessori schools (Lillard & Else-Quest, 2006). Moreover, early eyewitnesses frequently commented on the lack of bullying in the early Montessori schools (see Phillips et al., 2022). It is arguable that this was a direct result of the emphasis on the Exercises of Grace and Courtesy which took place daily in authentic Montessori schools and enabled children to embody respect, kindness, and empathy towards others.

This approach is very different from that used in many playschools where children are constantly admonished to "share," "play nice," etc. Although these admonitions are well intentioned, they are often ineffective. The Montessori Exercises of Grace and Courtesy differ significantly in that these exercises, being made into physical actions rather than just admonitions, become part of the child's procedural memory. When children are exposed daily to patterned, repetitive exercises that embody kindness during this sensitive period when they are most open to learning empathy, the physical learning of empathy becomes hardwired into the child's psyche; it is difficult to eradicate because procedural memories are hard to unlearn (Grigsby & Stevens, 2001). This concept is important because research on memory suggests that procedural memory actually forms a person's character; these behaviors become "who we are" (Grigsby & Stevens, 2001, p. 102).

Denervaud and colleagues make some important observations on how school systems shape children's knowledge and creative abilities, which may have bearing on the topic under discussion. They write: "Children in a Montessori pedagogy are immersed in a more enriched

and diverse school environment. They explore concepts through real life activities and interactions with their peers” (Denervaud et al., 2022, p. 1). She goes on to state that: “Children, by perceiving concepts and understanding more flexibly, may be more open to others” (Denervaud et al., 2022, p. 1). Perhaps we should think of the sensitive period for the social aspects of life as a period for social and emotional development because that is essentially what it is.

### **Dr. Montessori’s concept of a sensitive period for order**

*The little child’s need for order is one of the most powerful incentives to dominate his early life.* (Montessori, 1967, p. 190)

Dr. Montessori was convinced that there was nothing “haphazard” about the development of the human mind: “If the whole universe is governed by fixed laws, is it possible that the human mind be formed haphazardly, i.e., without any law at all?” (Montessori, 1975, p. 9). She argued that “Nature gives small children an intrinsic sensibility to order” (Montessori, 1936, p. 55) as an aid to their efforts to “construct” their own brains. It is arguable that that Dr. Montessori was (and still is) unique among educators in that she recognized and utilized the power of the sensitive period for order which promotes the repetition of orderly exercises and activities to aid children in the optimal construction of their brains, because in the larger, biologically-driven picture, healthy brain development is needed for the continuation of a healthy species. She aided the development of children’s sequential memory by designing curricular activities that involve order and sequencing and by laying out the prepared environment in an orderly way. The following paragraphs elaborate on these points.

Dr. Montessori’s meticulous observations of children convinced her that all children experience a “sensitive period for order” (Montessori, 1936, p. 55; 1967, p. 190). This sensitive period begins at birth but is most noticeable between two to four years, often because of the

distress its infringement causes to the child. It is arguably the most important of the sensitive periods and, regrettably, the least recognized or understood by parents and teachers alike. Dr. Montessori was convinced from her observations of young children that, during the sensitive period for order, nature programs young children to focus on patterns, routines, and sequences in their daily life to help them in their brain construction. Since children construct their brains from what they find in their immediate environment, it follows that if that environment is chaotic, children's brain development may not be optimal. On the other hand, if children's immediate environments are well-ordered and there are no other endangering factors (such as genetic predispositions to abnormal brain development or other adverse conditions), children stand an excellent chance of having optimal brain development.

Once Dr. Montessori recognized this sensitive period for order, which only exists during the first plane of development, birth to six years, (Montessori, 1971), she constructed her Case dei Bambini (Children's Houses), to cater for it by embedding order onto every aspect of the environment, both indoors and outdoors. In practice, this means that the physical layout of the prepared environments for children in this age range is meticulously orderly. For example, the materials for each curriculum area (practical life, sensorial, language, mathematics, cultural) are laid out in an orderly fashion on sets of shelves. Each set is arranged sequentially from the most basic level of difficulty to the most complex. Each child is shown from the outset how to carry the materials carefully to a mat or a table to work with them and then how to replace them on the correct shelves when he or she is finished.

Many of Dr. Montessori's contemporaries understood the groundbreaking significance of what she was doing. The assistant editor of the London Times Educational Supplement, having had talks with Dr. Montessori over the course of several months in 1919 about her method, wrote: "This is not merely a new way of amusing children—it is the beginning of a re-organization of the human mind" (Radice, 1920, p. 11). Order and sequence are to be found

everywhere in an authentic Montessori environment. More importantly, this practice of sequencing is essential for the development of sequential memory, which is a vital element of healthy brain development and is particularly necessary for the development of literacy and numeracy skills.

**Sequential Memory—What It Is and Why it is Impaired in Some Children.** Craig (1992) explains the importance of sequential memory, a type of memory which can remember visual and auditory input in sequence, in the learning process: “A child’s successful completion of many academic tasks depends on the ability to ‘bring linear order to the chaos of daily experience’” (p. 67). She explains that in the first few years of life, sequential memory is not yet developed and the brain records events “much like a series of snapshots that capture the essence of experience but may lack a linear sequence” (p. 67). The cognitive process that crafts these “snapshots” and into a linear sequence is sequential memory. Sequential memory is clearly not something we are born with. It is something that must be developed. Craig argues that there is a crucial need for stable, predictable, ordered environments and equally stable caregiving, for the successful development of sequential memory: “The transition to sequential semantic memory is most easily made in environments marked by consistent, predictable routines and familiar, reliable caregivers” (p. 67). She emphasizes that when these conditions are not available, sequential memory does not develop properly: “In the absence of these factors, children may continue to encode new information episodically or not at all” (p. 67).

As we know, many children do not grow up in stable environments. This is particularly true of children brought up in the care system and homes where there is substance misuse or mental health issues. In these circumstances, the threats to the development of sequential memory are serious. Craig (1992) also argues that children who grow up in homes where rules

can vary according to the transient inclination of the caregiver will have difficulty developing sequential memory: “Children raised in households in which rules and routines are subject to the whim of the parent may lack the consistency and predictability required to move easily into a more sequential ordering of the world” (p. 67). This impacts both children’s ability to learn and especially their struggles to learn within a school environment that relies on sequential ordering. Craig argues that many children’s difficulties in school relate to their having what she refers to as “a learning style that is unresponsive to school environments that rely on sequential ordering” (p. 68).

**How the Montessori Method Aids the Development of Sequential Memory.** The emphasis on order in authentic Montessori schools, which necessarily involves carrying out activities in a sequence, leads to the development of sequential memory. For children whose exposure to a chaotic home environment has impeded the building of sequential memory, the Montessori school could be a significant aid to their development. Every activity the child engages in—whether it is scrubbing a table, washing a window, or polishing a mirror— involves a meticulously planned sequence of steps to enable not just the completion of the activity, but, in the long term, to aid the development of a healthy brain. Therefore, in an authentic Montessori school, the disadvantages a child suffers from exposure to a chaotic home environment can be compensated for, daily, by the multitude of “sequencing” opportunities made available to the child through the Montessori materials and exercises.

## **Discussion**

This paper offers a unique contribution to the field of Montessori research by comparing some of the core principles and recommended activities of the Montessori Method with some of the core principles and recommended activities of the now-acclaimed NME. The author is

unaware of any other study that does this. The paper also examines Dr. Montessori's unique use of sensitive periods in development for educational purposes (in particular, her use of the sensitive periods for movement, the social aspects of life, and the sensitive period for order respectively) and argues that, in utilizing the sensitive periods for educational purposes, she was actively promoting an approach to human development that appears to anticipate what Perry calls a developmentally sensitive and biologically respectful model of education.

In many countries, there has been a move away from authentic Montessori practices, including the facilitation of sensitive periods. This, it could be argued, is resulting in poorer outcomes for children. Often, this is because of national policies relating to early years curricula. For example, many teachers feel they are under growing pressure to apply curricula that (a) take no heed of the sensitive periods in development or (b) trample over the sensitive periods in development—in particular the sensitive period for order, which is most vulnerable to being ignored by teachers and parents alike. Frequently, Montessori teachers feel that they have no choice here. A country's early years curriculum is often designed by people who have no knowledge of Dr. Montessori's discoveries, especially in relation to sensitive periods and the sensitive period for order in particular.

In addition, Montessori teachers often report that parents are often suspicious, or even afraid, of classrooms that look too structured or too tidy. Also, there may be a perception among parents that a structured classroom will not support a play-based curriculum, and so teachers are nervous of making their classrooms look too tidy or structured. Because of this, many teachers (some interviewed by the present author) state categorically but wistfully that they can no longer prioritize the sensitive periods, especially the sensitive period for order, when laying out their environments.

If the sensitive periods in development, and in particular the sensitive period for order, are a vital developmental need in children under 6 years, then it follows that failure to recognize and support sensitive periods may be a failure to meet children's developmental needs and therefore may be harmful to children. It is vital to make teachers and the public aware of the power of sensitive periods in development for all children, especially for those with developmental problems, in a similar way to that by which Perry is making teachers and the general public aware of the basics of brain development in children.

In conclusion, the findings of this study suggest that the NME and the Montessori Method share many commonalities. Specifically, Perry's findings in relation to the vital importance of positive relational interactions between adults and children to promote healthy human development are in line with Dr. Montessori's early emphasis on the necessity for the teacher to feel and demonstrate, in daily practice, a genuine love for the human child. The 6 R's recommended by the NME align with original Montessori principles which emphasize that the children's houses were relational, the activities were rhythmic, repetitive, relevant, and rewarding, and every aspect of the environment was respectful. This paper would argue that the neuroscience behind the NME sheds light on the early success of the Montessori Method in bringing social, emotional, and cognitive flourishing to large numbers of children. In addition, this gives reason for great optimism that the Method still has the power to promote human flourishing in our current times because Dr. Montessori's "scientific pedagogy" is still entirely replicable.

## References

- Babini, V. (2000). Science, feminism, and education: The early work of Maria Montessori. *History Workshop Journal*, 49(1), 44–67. <https://doi.org/10.1093/hwj/2000.49.44>
- Babini, V., & Lama, L. (2000). *Una donna nuova: Il femminismo scientifico di Maria Montessori*. Milano, Italy: Franco Angeli.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Braun, V., & Clarke, V. (2022). *Thematic analysis: A practical guide*. SAGE Publications Ltd.
- Craig, S. E. (1992). The Educational Needs of Children Living with Violence. *Phi Delta Kappan*, 74(1), 67–68, 70–71.
- Denervaud, S., Christensen, A., Kenett, Y., & Beaty, R. (2022). How school systems shape children’s knowledge and creative abilities. <https://npjscilearncommunity.nature.com>
- De Stefano, C. (2022). *The child is the teacher: A life of Maria Montessori*. Other Press.
- Fynne, R. J. (1924). *Montessori and her Inspirers*. Longmans; Green and Co.
- Galitch, S. (2021, May 15). *Science—Montessori is good for the brain*. Archyworldys. <https://www.archyworldys.com/science-montessori-is-good-for-the-brain/>
- George, A. E. (1912, July). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping*, 55(1), 24–29.
- Grigsby, J., & Stevens, D. W. (2001). *Neurodynamics of Personality*. The Guilford Publications.
- Horne, H. (1904). *The Philosophy of Education*. Macmillan Press.
- Itard, J. (1802). *An Historical Account of the Discovery and Education of a Savage Man*. Richard Phillips.
- Kramer, R. (1976). *Maria Montessori: A biography*. Basil Blackwell. Oxford.



- Lillard, A., & Else-Quest, N. (2006). Evaluating Montessori Education. *Science*, 313(5795), 1893–1894. <https://doi.org/10.1126/science.1132362>
- Ludy-Dobson, C. R., & Perry, B. D. (2010). The role of healthy relational interactions in buffering the impact of childhood trauma. In E. Gil (Ed.), *Working with children to heal interpersonal trauma: The power of play*. The Guilford Press.
- Montessori, M. (1909). *Il metodo della pedagogia scientifica applicato all'educazione infantile nelle case dei bambini*. Scipione Lapi.
- Montessori, M. (1913). *Pedagogical anthropology* (F. T. Cooper, Trans.). Frederick A. Stokes Company.
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. And Trans.). Longmans; Green and Co.
- Montessori, M. (2013). The House of Children, Lecture, Kodaikanal, 1944. *NAMTA Journal*, 38(1), 11–19.
- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books. (Original work published 1912)
- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans.). Holt, Rinehart and Winston. (Original work published 1949)
- Montessori, M. (1971). *The Four Planes of Education*. AMI Communications.
- Montessori, M. (1975). *The Formation of Man*. (Trans. by A.M. Joosten) Kalakshetra Publications. (Original work published 1949)
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). Montessori-Pierson Publishing Company.
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–255. <https://doi.org/10.1080/15325020903004350>

- Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook—what traumatized children can teach us about loss, love, and healing*. Basic books.
- Perry, B. D., & Winfrey, O. (2021). *What happened to you? Conversations on trauma, resilience, and healing*. Flatiron Books.
- Phillips, B., O'Toole, C., McGilloway, S., & Phillips, S. (2022). Montessori, the white cross, and trauma-informed practice: Lessons for contemporary education. *Journal of Montessori Research*, 8(1), 13–28. <https://doi.org/10.17161/jomr.v8i1.15767>
- Radice, S. (1920). *The New Children: Talks with Maria Montessori*. Frederick A. Stokes Company.
- Séguin, E. (1866). *Idiocy and its Treatment by the Physiological Method*. William Wood & Co.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, 40, 77–82.
- ThinkTVPBS. (2020a, August 25). *Stress, trauma, and the brain: Insights for educators—the neurosequential model* [video]. YouTube.  
[https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020b, August 25). *Stress, trauma, and the brain: Insights for educators—how stress impacts brain function*. YouTube.  
[https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020c, August 25). *Stress, trauma, and the brain: Insights for educators—the power of connection*. YouTube.  
[https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)

ThinkTVPBS. (2020d, August 25). Stress, trauma, and the brain: Insights for educators—  
regulating yourself and your classroom. YouTube.

[https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)

ThinkTVPBS. (2020e, August 25). Stress, trauma, and the brain: Insights for educators—  
educator strategies for the classroom. YouTube.

[https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)

## **CHAPTER 7**

### **The perceived effectiveness of the Montessori/TIP programme: A case study.**

#### **(Study 3)**

This chapter contains the paper “**Assessing the perceived effectiveness of a newly developed trauma-informed practice (TIP) programme for early childhood teachers**” which is under review with the *Irish Educational Studies* journal.

This paper is based on findings from Study 3, which was conducted by the researcher to answer the third research question: - “What is the perceived impact, acceptability, feasibility, and overall experience the programme, particularly with regard to the knowledge, attitudes, beliefs, and professional practice of teachers?”

**“Assessing the perceived effectiveness of a newly developed trauma-informed practice (TIP) programme for early childhood teachers”.**

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### **Abstract**

Childhood adversity and trauma are widespread and there is increasing recognition of the need for trauma-informed practice (TIP) (i.e., practice that recognises and responds to the potentially long-term negative impact of trauma on individuals), in a range of settings, including early childhood education. Since historical evidence shows that early Montessori schools were widely reputed to promote psychological healing in trauma-affected children, this study aimed to develop and explore the perceived impact (e.g., in terms of knowledge, attitudes, beliefs, and professional practice) of a newly developed Montessori-attuned TIP programme designed to enhance the capacities of early childhood educators to support trauma-affected children. A total of 11 early childhood teachers in one Montessori school, took part in the study which utilised a qualitative, evaluative case study design. The results demonstrate post-programme increases in teacher self-reported knowledge of trauma, TIP, and early Montessori approaches, as well as positive reported changes in participants' attitudes, beliefs, and professional practice. However, there were mixed views on the overall feasibility of the programme due to perceived high-level barriers to wider acceptance and implementation. This study represents an original contribution to the fields of both TIP and Montessori research in providing some initial promising evidence as to how a new programme can help to inform and empower teachers to integrate TIP into their daily professional practice, and by so doing, potentially transform their work settings into trauma-informed environments that effectively support children impacted by trauma.

Keywords: trauma-informed practice, Montessori schools, mental health, childhood trauma/adversity

## Introduction

Increasing interdisciplinary research over the last 25 years (in the fields of medicine, epidemiology, neuroscience, psychology, sociology, and education) has shown that childhood adversity and trauma can negatively impact the physical, emotional, social, and cognitive functioning of children (Burke Harris 2019; Felitti et al. 1998; Herman 2015; National Scientific Council on the Developing Child NSCDC 2020; Perry & Szalavitz 2017; van der Kolk 2014), often contributing to poor mental health and wellbeing. Childhood adversity includes exposure to poverty, homelessness, discrimination, and racism, as well as neglect, abuse, and other negative experiences (Felitti et al. 1998; Merskey et al. 2017). Trauma occurs when exposure to these types of adverse experiences overwhelm children emotionally and psychologically, often leading to *'lasting adverse effects on their mental, physical, social, emotional, or spiritual well-being'* (Substance Abuse and Mental Health Services Administration, SAMSHA 2014, p. 7). Specifically, research shows that exposure to adversity or trauma in childhood can potentially have a very damaging effect on a child's ability to develop attachments, regulate their emotions, make friends, collaborate with others, and use language, memory, or reasoning skills, all of which, in turn, may adversely affect mental health and well-being (Cole et al. 2005, 2013; Craig 2016). As a consequence of these concerns, there is an increasing awareness, in recent years, of the need to make human services, including education, more trauma aware and trauma-informed (Alexander 2019; Jennings 2019; Maynard et al. 2019; Nicholson et al. 2023; Overstreet & Chafouleas 2016; Thomas et al. 2019).

The Montessori Method is an educational approach developed by Maria Montessori (1870 to 1952), who was recognised by her contemporaries and later scholars as *'a brain specialist'* (Radice 1920, 1), an *'expert in children's mental illnesses'* (Guttek and Guttek 2016, 32), a *'competent clinical psychiatrist'* (Povell 2010, 40), and a woman who *'carved out a*

*remarkable career, from psychiatrist to educationalist*' (Babini 2000, 45). Montessori opened her first class at the Orthophrenic Clinic in Rome where many 'mentally challenged' children were housed because they could not function in their homes or schools (Montessori 2008). Later, in 1907, the *Case dei Bambini* or "Children's Houses" were opened in San Lorenzo, an impoverished district in Rome, as part of a social project aimed to ameliorate the lives of the children and families who lived there (De Stefano 2022; Kramer 1976: Montessori, 1912/1964). It is estimated that there are approximately 16,000 Montessori schools around the world (Debs et al. 2022; Debs 2023) and likewise, Montessori/early childhood settings for children between 3 and 6 years are common in Ireland.

Historical literature shows that Montessori early childhood settings can be healing environments for young children who have been affected by adversity and/or trauma (Bailey, 1915; Cromwell 1916/2006; Fisher 1912). In fact, in 1917, Montessori tried to establish free interdisciplinary programmes to help teachers and nurses to support children affected by trauma arising from exposure to wars and natural disasters (Montessori 1917/2013). However, apart from three relatively recent publications, there is a marked gap in contemporary literature relating to Montessori's expertise and involvement with trauma-affected children and what we can learn therein (De Stefano 2022; Moretti 2021; Phillips et al. 2022). This newly developed programme, which integrates contemporary trauma theory with Montessori's original practices with trauma-affected children, helps to fill this gap.

## The Programme

The overarching aim of the new programme was to enhance the capacity and skills of early childhood teachers, and specifically to expand and deepen their understandings, attitudes, beliefs, and practices in ways that will enable them to better support trauma-affected children



(Guskey 2002). The programme content is based on an analysis of contemporary trauma theory coupled with an in-depth analysis of Montessori’s approach to healing adversity-experienced and trauma-affected children (Phillips et al., 2022). The specific objectives of the programme are: (1) to provide practitioners with an in-depth knowledge of the nature and impact of childhood adversity and childhood trauma and its potential long-term negative effect on the physical, emotional, social, and cognitive functioning of developing children; (2) to equip practitioners with Montessori-informed knowledge and information about child mental health and psychological healing; (3) to convey an understanding of what ‘trauma-informed practice’ is and how a school can incorporate it into their school policies, culture and ethos and (4) to provide an understanding of how contemporary early childhood education settings and Montessori schools can infuse Montessori-attuned, trauma-informed principles into their daily practice. The programme comprises 4 x 5-hour sessions conducted over a period of eight weeks in the Autumn semester, followed by 2 x follow-up sessions in the Spring semester. All sessions were delivered on-site (by the first author) using a mix of didactic methods and discussion/debate. Table 1 (below) provides an overview of the programme.

**Table 1**

<b>Table 1: Overview of the programme</b>	
<b>Session 1</b>	<b>Historical approaches to TIP - Montessori</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• Brief introduction to Dr. Maria Montessori</li> <li>• Montessori’s work with trauma affected children</li> <li>• Montessori’s approach to healing trauma affected children</li> </ul>
<b>Session 2</b>	<b>Trauma</b>

Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is trauma?</li> <li>• Trauma Versus Stress</li> <li>• The Stress Response</li> <li>• Survival Strategies - hyper and hypo - arousal</li> <li>• The window of tolerance</li> <li>• The Polyvagal Theory</li> <li>• The PACE model</li> </ul>
<b>Session 3</b>	<b>Trauma Informed Practice</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is TIP</li> <li>• The 6 core principles of TIP (SAMSHA 2014)</li> <li>• The 4 main assumptions of TIP (SAMSHA 2014)</li> </ul>
<b>Session 4</b>	<b>TIP in Contemporary Early Childhood Settings</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• How to incorporate the 6 TIP principles in contemporary Early Childhood Settings</li> <li>• How to incorporate the TIP assumptions in Early Childhood Settings</li> <li>• How to incorporate the TSP in contemporary Early Childhood Settings</li> </ul>

## Method

For the purposes of this project, an evaluative case study design was chosen because it can provide ‘educational actors or decision-makers (administrators, teachers, parents, pupils, etc.) with information that will help them to judge the merit and worth of policies, programmes, or institutions’ (Stenhouse 1988 50).

### Participants and setting

One school, located in a suburban town west of Dublin (Ireland) and all of its teaching staff (including the manager) n=11, agreed to participate in the study. This particular school was chosen because it had a significant number of qualified Montessori teachers, (over half) and a

low staff turnover/high staff retention; for example, most of the teachers had worked there for over a decade and so were very experienced. It is a Montessori preschool and creche which offers full day care for children from 2 ½ to 5 years, and out of school care to children from 4 to 12 years. It is open 51 weeks a year, from 7:30 am to 6 pm. All meals are provided, along with homework-support, games, and recreational activities. There are four well decorated, bright classrooms and a large and equally well-equipped outdoor play area.

Of the 11 teachers who participated in the research, over half had diplomas/certificates in Montessori pedagogy and the other half had levels of training in Early Childhood Education and Care up to degree level. Several staff also had training related to the care of children with additional needs. Professional development was highly regarded by staff members and all staff are trained in First Aid, (with several staff trained in the First Aid Responder Course, FAR), Child Protection & Safeguarding, and Food Hygiene. The children and families using the service live in the immediate locality and surrounding areas. Up to 20% of the children attending the school may have refugee status in any given year. These children and their families live in ‘Direct Provision’, a system of asylum seeker accommodation used in Ireland (which typically involves living in a small room (e.g., a hotel room) with communal kitchen and bathroom facilities).

## **Measures**

A Topic Guide was developed for purposes of holding two focus groups with all participants in the Spring semester following the delivery of the programme. This was based on a detailed review of the relevant literature and included questions around the participants prior knowledge (if any) of childhood trauma, TIP, and Montessori’s historical involvement with trauma-affected children. Questions relating to the participants’ attitudes and beliefs relating to ‘difficult’ behaviours in children were also posed. In addition, participants were asked to give

their opinions on the feasibility of the programme. Detailed fieldnotes were also recorded by the facilitator (the first author) during the entire process of programme start-up and delivery.

### **Data Analysis**

The qualitative data were analysed using Braun and Clarke's Reflexive Thematic Analysis (RTA: Braun and Clarke 2022). This method involves an iterative process. Step 1 involves 'Familiarisation with the dataset' by reading and re-reading the literature, taking note of any recurring features and the researcher's initial thoughts about how to begin to code the data. Step 2 involves 'Coding the data', i.e. creating meaningful, relatively short 'labels' that extract recurring ideas out of the data. From the outset, the codes created are recognised as representing the researcher's interpretations of patterns of meaning across the data set. There is no attempt to disengage the researcher's subjectivity from the analytical process, rather, RTA is built on what Braun and Clarke call the researcher's 'critical reflection on your role as researcher, and your research practice' (Braun and Clarke 2022, 5). Step 3 involves 'Generating themes', i.e., starting to identify potential themes, such as in this case – 'Changes in knowledge.' In this study we adopted a deductive approach, in that the identification of themes was influenced by existing theories and knowledge. Step 4 involves 'Reviewing and developing the themes' through an iterative process of refinement of the potential themes. Some themes may be combined with others, and some may be eliminated. Step 5 involves 'Naming the themes' i.e., giving each theme a clear and engaging description while the final step involves the write-up of the findings.

### **Findings**

Five themes were identified from the analysis and are discussed below. Pseudonyms are used to protect the anonymity of the participants.

### ***The importance of repetitive, rhythmic activities in the healing of trauma***

Montessori's emphasis on the importance of movement and rhythmic activities to promote regulation in children was discussed in the sessions using many examples based on the participants' practical day-to-day experiences with children. Specifically, we discussed Montessori's discovery that repetitive gross motor rhythmic activities such as sweeping, scrubbing, polishing, and repetitive small motor activities involving comparing, contrasting, categorising, can help to calm the body's stress response system (Phillips et al. 2022; Phillips 2022). Building on this, the programme introduced the participants to the Neurosequential Model in Education (NME) and in particular its emphasis on the importance of repetitive, rhythmic activities in the healing of trauma. The teachers, both Montessori trained and not, showed great interest in this TIP model, and were intrigued that Perry's work which is based on contemporary neuroscientific principles confirms what Montessori intuited over a century ago and they could clearly see how Montessori's work anticipated Perry's neuroscientific insights into the power of "*patterned, repetitive, rhythmic activities*" (Perry 2009, 243) to reduce anxiety and calm the dysregulated brain.

Two of the participants, Luisa and Katerina, said – *'We find those 3 R's, Perry's 3 R's 'regulate, relate and reason' really work'*. They described a little boy in one of their classes who often becomes dysregulated, leading to 'difficult' behaviours noted that offering him a rhythmic activity (in this case vigorously cleaning chairs) helped to sooth him. Katerina said - *'When he is here for the full day, he can be very difficult'*. Luisa added that the effect of this activity on him was amazing – *'He just calmed down'*. They said they now see clearly that this calming is brought about by the repetitive, rhythmic movements, and they noted (as Montessori did) that whenever children calm down following engagement in regulatory, rhythmic activities, it is then that they can *'relate'* or reach out in a sociable manner to other adults or children.

### ***The importance of positive relational interactions in TIP***

Another aspect of the NME that was examined in detail during the sessions was relational neurobiology (i.e., the science that recognizes that humans are relational creatures and thrive on being socially accepted) and the importance both Perry and Montessori place on positive relationships, and positive relational interactions, in the healing of trauma-affected children. Specifically, Montessori's emphasis on the role of positive relational interactions in the healing of trauma-affected children was discussed. The participants were very interested in Montessori's accounts of the first children with whom she first worked, who were expelled from their schools and labelled 'mentally challenged' and incapable of learning. However, when she applied what we now consider principles of relational neurobiology, many of these children started to engage in academic learning and even passed their State Examinations. The participants stated that Montessori's clear description of how she put relational neurobiology into practice was very helpful to them. For example, when the street children entered her school in 1897, she described how she greeted them with "*hearty manifestations of welcome and with genuine cordiality*" and "*For the first time they were made to feel that they were wanted and desired*" (Montessori 2008 264). Participants stated that these specific quotations helped them to understand how relational neurobiology is applied in daily practice.

There was a clear consensus that this was one of the most important factors in TIP and was also the easiest element to implement. For example, Loretta commented that '*a little bit of love, a little bit of affection, they crave it, and they thrive on it too*'. There were lively discussions in which they agreed with Perry's view that the most important healing experiences in the lives of trauma-affected children do not occur in therapy itself (Perry & Szalavitz, 2017), but in simple actions such as a warm smile from the teacher on arrival, a 'high five' throughout the day, or a pat on the shoulder and a 'well done Jonny'/'well done Mary.' They also appreciated how Montessori's work anticipated Perry's neuroscientific insights into the power

of positive relational interactions to help children to become resilient and overcome trauma, (Ludy-Dobson & Perry 2010).

There were equally engaged discussions on the importance of the *power of community* to support trauma-affected children, especially refugee children, to experience a sense of belonging and to feel safe and loved. For example, Luisa commented,

*‘This could be their only safe space. These three hours a day could be the only time they can just let go, feel safe, have fun with their friends - then they go back to a hotel room (i.e., Direct Provision)’.*

Another participant, Giovanna said, *‘this little community may well be the only place where the children get to speak English’* in the company of other children. She noted that many of the refugee parents do not speak English at all and that their children seemed to derive a feeling of belonging and community just from having the opportunity to speak English with the other children. *‘They feel like they belong’* Loretta said.

Participants engaged in lively and sometimes emotional discussions about the importance of positive relationships in human development and how these are key to the healing of trauma-affected children. Some participants said that they now found themselves reflecting on their own past experiences in the light of this new knowledge and were beginning to see things differently. Isabella, one of the early childhood educators, reflecting on her new understanding of the power of positive relationships in human development said,

*Now I have obsession to tell my daughter “I love you, I love you, I love you” because I did not feel that love when I was growing up ... I did not get hug ... or she never tell me “I love you” – I want to be different with my daughter.*

Luisa, one of the Montessori teachers said *'it's really exciting'* to see how Montessori (like Perry in later years) backed up her *regulatory* activities (such as scrubbing a table), with *relational exercises* through the use of her (now quaintly named) *Exercises of Grace and Courtesy* which essentially were lessons in the form of 'mini dramas' acted out by children which aim to promote positive relational interactions between children and their peers through embodied learning (e.g. how to wait, take turns, or resolve a disagreement) and as the archival literature shows, were helpful in addressing bullying in schools (Phillips et al., 2022; Phillips, 2022). Overall, participants stated that the interdisciplinary knowledge to which they were introduced as part of the programme, especially in relation to the NME, increased their knowledge significantly, whilst also encouraging and empowering them to take the necessary steps towards becoming a trauma-informed school.

### ***Greater understandings of children's behaviour***

When asked during the focus groups about the extent to which the new TIP programme had changed some of their attitudes and/or beliefs, there was a consensus amongst participants that their understanding of children's 'difficult' behaviour had improved, and their compassion had increased. *'You couldn't but be changed by it – for the better – you know'*. (Loretta). Another participant, Shania, described her sadness and frustration at what she perceived as a lack of understanding from a primary school teacher from whom she daily collected a child to take him back to their afterschool. She said the teacher was usually very critical of the child's behaviours in school but noted that *'She didn't take into account the child's living circumstances'*. She commented:



*He's a child in Direct Provision – he's basically homeless, living in a hotel room and they are not taking any of that into consideration – they are criticising him, saying he's crying because he didn't get the jelly sweet (i.e., reward for good behaviour).*

Another participant, Loretta added,

*'If they [primary school teachers] were trained in TIP, it would totally change their attitudes ...I wonder are they ever going to introduce something like this into the [primary]schools so they would be trauma informed? It would make such a difference to their practice, wouldn't it really?'*

These comments indicate that the new programme appeared to have had a substantial impact on the participants' attitudes and increased their, already high, levels of empathy and compassion for children. It also appears to have convinced them of the need for the programme to become part of initial and on-going teacher education at both primary and post-primary levels. Changes in participants beliefs especially in relation to children's behaviour was also a topic of considerable discussion in the focus groups. In general, the participants revealed that prior to participating in the programme, they had a deeply held compassionate approach to children's behaviour and that the course had confirmed their 'gut feeling' that there is always an underlying reason for difficult behaviour in children, as illustrated by the following comment:

*I always believed that there was most likely an underlying cause for difficult behaviour, but never knew or understood how trauma could affect the child.*

### *Appreciation of a teacher's impact on a child's life*

Participants also discussed how the programme had changed their attitudes and beliefs in relation to the significant impact of a teacher on a child's life. During one of the sessions, Katerina, one of the early childhood educators described teachers as *'the foundations for the child's life – we can give them self-esteem, confidence, safety.'* This led to an animated discussion among the teachers on how even their preliminary efforts to help dysregulated children (especially refugee children) were being supported by the learning they had gained on the course. Some participants excitedly recounted their experiences of implementing the programme with the children –

*Our lunch time conversations are all about this (TIP) now. We run in and out of each other's classrooms telling each other what we tried with certain children and how great it's working ... It's definitely impacting on the service, and in a good way.*

It was also noted during the observation of the sessions that the teachers' sense of the positive role they can play in changing the trajectory of a child's life is not a theoretical one but something that, it was felt, could be achieved through simple, practical day-to-day steps.

Several participants, reflecting on their own early school years, recollected teachers who had identified their strengths and built on them. One participant recalled a teacher who recognised her strong interest in reading and actively encouraged it by loaning her books and suggesting she enrol in the local library. The participant said her career as an early years educator which she loves and derives great personal satisfaction from, is attributable, in no small way, to this teacher's efforts. Another participant remarked - *'educators have a lot of power to change a child's life - even a trauma-affected child's life - through ordinary everyday things - like - like this - identifying a child's strengths and building on them'*.

### *The practice-related benefits of inter-disciplinary knowledge*

Another theme identified from the findings, related to the participants' appreciation of the benefits of interdisciplinary knowledge about trauma/adversity, TIP, and Montessori, and how this can be effectively translated into professional practice. One participant, Loretta (who was the owner/manager of the setting) stated, *'I think it [the programme] has increased our knowledge 100-fold' because of the wealth of knowledge it gave us*". Another said, *'I never thought that research from medicine, neuroscience, etc., would have any relevance to education'*.

Many participants indicated that the interdisciplinary nature of the programme was really *'eye-opening'*. All also agreed that the knowledge they had gained from participating in the programme about (a) the widespread nature and prevalence of adversity, (b) the effects of trauma on the brain; (c) TIP; and (d) Montessori's involvement with trauma-affected children, was new to them. A number of participants said that this interdisciplinary knowledge has made them *'more tuned in now'* and *'more aware of the possibility that there has been trauma in a child's life,'* and made them more confident in their professional practice about responding to trauma-affected children using TIP principles.

In the final focus group, many participants stated that the programme had *'transformed'* their knowledge, attitudes, beliefs, and professional practice. Loretta, the owner/manager of the school acknowledged that they had started from the vantage point of being a good school, where compassion, kindness, consideration, and love for the children, as well as high standards of learning and development were well established in daily practice. Despite this, she and the other teachers found the course to be *'transformational'* in that it changed the lens through which they viewed children. Specifically, she stated that they all now apply a trauma-informed lens when they encounter what in the past would have been seen as children with *'difficult'* or *'challenging'* behaviours. Loretta, the manager stated,

*'It's been transformational – totally transformational. The way we view children now is so different. Now, we immediately ask the question 'What happened to you?' rather than 'What's wrong with you?'*

She added, *'This programme has had a hugely positive impact on our professional practice'*. She then added that recently when the setting had a routine inspection, and upon telling the inspector that the staff had just completed this TIP programme, the inspector was very complementary of the setting, praising the calmness in the children, and the warm, understanding, and loving interactions between the staff and the children. Loretta, said, *'It was lovely to hear, when she [the inspector] said "There's so little to improve - such a warm atmosphere – throughout the whole service"* The manager attributed much of this positive professional practice to the way staff had embraced key messages of the programme.

### ***The feasibility of the programme***

The final theme focused on the participants' opinions on the feasibility of the programme. Here, the opinions were mixed. On the one hand, all of the participants felt that the programme had been hugely beneficial to their practice and recommended that it be made widely available to preschools, primary schools, and second-level schools. Loretta said, - *'Montessori is the perfect vehicle for introducing TIP.'* Luisa added:

*I think Montessori is the ideal method for it [TIP] because of all the repetition and what we've learnt is that repetition is what regulates the child – they go hand in hand – we've seen it ourselves – how it calms and regulates.*

Loretta said, *'For a child that has suffered trauma, it is a perfect thing for them – to be allowed to repeat activities and self-regulate.'* Luisa made the point that the Montessori approach is 'perfect' for the growing number of refugee children who often do not speak English, because it can help them to regulate their emotions without the need for language:

*In Montessori, it doesn't matter what language you speak – you can show someone in silence - you don't have to use language... I think it will be very beneficial for those children [refugees] - they can be included in the self-regulation without language barriers.*

On the other hand, some participants felt that the Montessori approach is not favoured as much as it used to be by the Irish preschool inspectorate since the introduction of Aistear, the National Curriculum Framework, in 2009. Therefore, they felt that there might not be an appreciation of its capacity to support children to regulate their emotions through the use of the Montessori Practical Life exercises, nor an appreciation of its capacity to promote positive, relational interactions through its use of other socially oriented Montessori exercises. However, the perceived commonalities between the NME and the Montessori approach (enshrined within the TSP) were thought to possibly enhance the feasibility of programme roll-out into the future.

### **Discussion and implications**

The aim of this study was to assess the perceived impact of a newly developed programme for early childhood educators. The findings indicated post-programme increases in teacher self-reported knowledge of trauma, TIP, and early Montessori approaches with trauma-affected children, as well as positive reported changes in the attitudes, beliefs, and professional practice of the participants. However, there were mixed views among the participants on the feasibility

of the programme and especially in the context of wider curriculum changes in an Irish context. Arguably, however, the programme has a number of unique features which may appropriately compliment current early childhood approaches and practices both in Ireland and elsewhere. Firstly, the programme content is interdisciplinary, innovative and research informed, thereby bringing new knowledge and understanding to educators on for example, the importance of regulatory activities, and positive relational interactions in helping children heal from trauma; thus it provides teachers with practical strategies and approaches that enhance their capacity to help and support vulnerable children.

Secondly, by providing knowledge about the neurobiology of trauma, and its effects on the emotional, social, and cognitive functioning of children (i.e. which frequently manifest as negative behaviours in the classroom), teachers are helped to avoid misjudging children and believing that their behaviours are caused by defiance or wilfulness, when, in fact, they may be caused by processes more to do with the effects of trauma. Without this knowledge, teachers often unintentionally mislabel children because their behaviours are misunderstood (Mulholland & O'Toole, 2021). However, a teacher equipped with this knowledge is better able to understand trauma-affected children and so prevent re-traumatisation by mislabelling them (Craig, 2016).

Thirdly, the interdisciplinary knowledge provided on this programme improves teacher awareness of the many social injustices (poverty, unemployment, low wages, unaffordable housing, discrimination, and racism) which are often the root causes of trauma in children. Arguably, this kind of awareness can lead to more understanding of and compassion for the circumstances of many children. Indeed, if incorporated into early childhood teacher education, this programme may play a vital role in advancing greater equity in our schools, because trauma-affected children would be more likely to be given the support which they need and to

which they are entitled under Article 39 of the UN Convention on the Rights of the Child (UNCRC, 1989).

The findings reported here show that the newly developed programme had a positive reported impact on the teachers' knowledge, attitudes, beliefs, and professional practice. It had helped them to see the commonalities between the Montessori approach to helping trauma-affected children and contemporary trauma-informed approaches, especially the 'regulate, relate, and reason' model developed by Perry and the Neurosequential Network ([www.neurosequential.com](http://www.neurosequential.com)). This knowledge helped the participants to feel empowered to increase their use of Montessori activities/exercises that historically have been found to be beneficial in the healing of trauma-affected children. Another factor to emerge from the findings was the association between the participants' feelings of compassion for children especially those that are homeless and living in Direct Provision, and their positive attitude towards the programme and its feasibility. This is consistent with the findings of a recent study in Ireland which showed that compassion and being sensitive to the suffering of others, as well as self-compassion (i.e., which entails turning towards our own painful experiences and extending understanding to ourselves) were the strongest predictors of positive attitudes toward TIP (OToole and Dobutowitch 2023).

Notably, there was no attrition throughout the duration of the programme and there was an extremely high level of enthusiasm, interest, and participation throughout. This may have been due to the group dynamic and the fact that there were long-standing relationships of trust, commitment to each other, and to the school. Notwithstanding this possibility, the participants reported putting their theoretical knowledge into practice after the very first session and they began each subsequent session with informal though detailed and animated comments on how they were finding the implementation of the programme in their classrooms. Overall, they felt that their experience of engaging in the programme was "transformational", providing them

with a new way of working which helped them to see children through a trauma-informed lens. Indeed, this has been shown to be the hallmark of “transformational learning” (Mezirow, 1991), which is based on the idea that adult learners, when they are given new information, begin to evaluate their past experiences in the light of that new information, and often begin to change their perspectives and worldview as they critically reflect on their past often leading to new insights.

The content of some of the sessions involved issues of a sensitive nature which may have been relevant to participants’ past, and there was a need, therefore, for sensitivity during programme delivery. The course facilitator, (who was also the first author) felt a constant need to reflect on the ethical responsibility to protect the participants from emotional harm and to create and maintain a safe space in which they could share their thoughts and opinions (Carello and Butler 2015). Overall, despite the nature of the content, the participants reported enjoying the programme and there were many discussions in which shared experiences provoked laughter as well as tears. The participants indicated that it had become their ‘lunchtime conversation’ thereby suggesting that the knowledge and principles which they had learned, were already being embedded into the ethos and culture of the school. This is important because considerable evidence suggests that such whole-school approaches offer the most effective means to incorporate trauma-informed approaches within schools and other educational settings (Cole et al. 2005; Craig 2016).

This study was limited in a number of ways. First, the participants were from just one school thereby limiting the generalisability of the findings. Second, the school was atypical in that the majority of the teachers had been there for a long time and there was minimal staff turnover. However, this should also be construed as a strength of the study and a positive factor in terms of offering stability and quality care to the children attending the service. However, it would not be typical of childcare in many countries (including Ireland) where frequently, staff



turnover tends to be high, due to the low salaries often associated with childcare professions (Caven 2021). Furthermore, the school was atypical in that over half of the staff were qualified in Montessori pedagogy, whereas in many early childhood settings around the world who use the Montessori name, only a few of the teachers are qualified in Montessori pedagogy and so, in daily practice, they often stray from Montessori principles, raising questions about “fidelity issues” (Murray 2023). This was not the case in this setting.

In summary, the findings reported here, albeit based on a single exploratory study, provide initial promising indications that this newly developed TIP programme can improve knowledge, attitudes, beliefs and behaviours around trauma-informed care and practice. The findings are particularly timely because, currently, many countries have made a commitment to help child refugees from war-torn/conflict-affected areas across the world; it is important, therefore, for educators to have access to pedagogical approaches that have been shown to help trauma-affected children. Arguably, the Montessori method is such an approach, and indeed, its capacity to help ameliorate the effects of childhood trauma and promote mental health is now being increasingly recognised and promoted (Phillips et al. 2022; Phillips 2022; Cossentino 2016). However, more large-scale mixed methods research is needed to extend the delivery and subsequent evaluation of the programme using a larger sample of participants and schools across a range of early childhood education settings (and located in both rural and urban areas) and with several follow-up assessments. An attendant cost-effectiveness analysis would also provide useful insights into the programme’s value for money relative to its outcomes.

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The study received ethical approval from Maynooth University's Social Research Ethics Sub-Committee.

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## References

- Alexander, Jen. 2019. *Building Trauma-Sensitive Schools: Your Guide to Creating Safe, Supportive Learning Environments for All Students*. Brookes Publishing Company.
- Babini, Valeria Paola. 2000. "Science, Feminism and Education: The Early Work of Maria Montessori." *History Workshop Journal* 49, no. 1: 44–67. <https://doi.org/10.1093/hwj/2000.49.44>.
- Bailey, C. S. (1915). *Montessori children*. Holt
- Braun, Virginia, and Victoria Clarke. 2022. *Thematic Analysis: A Practical Guide*. SAGE.
- Burke Harris, Nadine. 2019. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. Marine Books.
- Carello, Janice and Lisa Butler 2015 "Practicing what we teach: Trauma-informed educational practice." *Journal of Teaching in Social Work*. Vol 35, (3) 262-278. <https://doi.org/10.1080/08841233.2015.1030059>
- Caven, Meg. 2021. Understanding teacher turnover in early childhood education. Yale school of medicine. <https://medicine.yale.edu/news-article/understanding-ece-teacher-turnover>
- Cole, S. F., Greenwald O'Brien, J., Gadd, M. G., Ristuccia, J., Wallace, D. L., & Gregory, M. 2005. *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children, Trauma and Learning Policy Initiative. <https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>
- Cole, Susan F., Anne Eisner, Michael Gregory, Joel Ristuccia, Trauma and Learning Policy Initiative, Massachusetts Advocates For Children, and Harvard Law School. 2013. *Helping Traumatized Children Learn: Creating and Advocating for Trauma-Sensitive Schools*.

- Cossentino, Jaqueline. (2016). Montessori schools help children exposed to trauma. In L. Flores Shaw (Ed.), *The Montessori White Papers, Vol. 2* (pp. 9–16). White Paper Press.
- Craig, Susan. 2016. *Trauma-Sensitive Schools: Learning Communities Transforming Children's Lives, K–5*. Teachers College Press.
- Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian refugees. *AMI Communications*, 2, 11–13. (Original work published 1916)
- Debs, Mira, Jaap de Brouwer, Angela K. Murray, Lynne Lawrence, Megan Tyne, Candice von der Wehl. 2022. “Global Diffusion of Montessori Schools: A Report From the 2022 Global Montessori Census” *Journal of Montessori Research* 8(2). 1-15.  
<https://doi.org/10.17161/jomr.v8i2.18675>
- Debs, Mira. 2023. “Global Montessori Education”, pp. 283-289. In Murray, Angela, Eva-Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. 2023. *The Bloomsbury Handbook of Montessori Education*. Bloomsbury Publishing.
- De Stefano, Cristina. 2022. *The Child Is the Teacher: A Life of Maria Montessori*. Other Press, LLC.
- Felitti, Vincent J., Robert F. Anda, Dale Nordenberg, David F. Williamson, Alison M. Spitz, Valerie J. Edwards, Mary P. Koss, and James S. Marks. 1998. “Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults.” *American Journal of Preventive Medicine* 14 (4): 245–58. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8).
- Fisher, D. C. 1912. *A Montessori mother*. Henry Holt & Company.
- Guskey, Thomas R. 2002. “Professional Development and Teacher Change.” *Teachers and Teaching* 8 (3): 381–91. <https://doi.org/10.1080/135406002100000512>.

- Gutek, Gerald L., and Patricia A. Gutek. 2016. *Bringing Montessori to America: S. S. McClure, Maria Montessori, and the Campaign to Publicize Montessori Education*. University of Alabama Press.
- Jennings, Patricia A. 2019. *The Trauma-Sensitive Classroom: Building Resilience with Compassionate Teaching*. W. W. Norton & Company.
- Kramer, Rita. 1976. *Maria Montessori: A Biography*. Addison-Wesley.
- Maynard, Brandy R., Anne S. J. Farina, Nathaniel A. Dell, and Michael S. Kelly. 2019. "Effects of Trauma-informed Approaches in Schools: A Systematic Review" *Campbell Systematic Reviews* 15 (1–2). <https://doi.org/10.1002/cl2.1018>.
- Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the Measurement of Adversity. *Child maltreatment*, 22(1), 58–68.  
<https://doi.org/10.1177/1077559516679513>
- Mezirow, Jack. 1991. *Transformative Dimensions of Adult Learning*. Jossey-Bass.
- Montessori, Maria. (2013). The White Cross. *AMI Journal*, 1-2, 37–41. (Original work published 1917)
- Montessori, Maria. (2008). *The California Lectures of Maria Montessori, 1915; Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series. Montessori-Pierson.
- Montessori, Maria. (1964). *The Montessori Method* (A. E. George, Trans.) Schocken Books. (Original work published 1912)
- Moretti, Erica. 2021. *The Best Weapon for Peace: Maria Montessori, Education, and Children's Rights*. University of Wisconsin Pres.
- Murray, Angela, Eva-Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. 2023. *The Bloomsbury Handbook of Montessori Education*. Bloomsbury Publishing.

- Mulholland, Michaela., and Catriona O’Toole. (2021). When it matters most: A trauma-informed, outdoor learning programme to support children’s wellbeing during Covid-19 and beyond. *Irish Educational Studies*, 40 (2), 329-340.  
<https://doi.org/10.1080/03323315.2021.1915843>
- National Council for Curriculum and Assessment, NCCA, 2009. “Aistear: The Early Childhood Curriculum Framework”.
- Neurosequential Network, [www.neurosequential.com](http://www.neurosequential.com)
- Nicholson, Julie, Linda Perez, Julie Kurtz, Shawn Bryant, and Drew Giles. 2023. *Trauma-Informed Practices for Early Childhood Educators: Relationship-Based Approaches That Reduce Stress, Build Resilience and Support Healing in Young Children*. Taylor & Francis.
- O’Toole, Catriona, and Mira Dobutowitsch. 2023. “The Courage to Care: Teacher Compassion Predicts More Positive Attitudes Toward Trauma-Informed Practice”. *Journal of Child and Adolescent Trauma*. 16:123-133.  
<https://doi.org/10.1007/s40653-022-00486-x>
- Overstreet, Stacy, and Sandra M. Chafouleas. 2016. “Trauma-Informed Schools: Introduction to the Special Issue.” *School Mental Health* 8 (1): 1–6. <https://doi.org/10.1007/s12310-016-9184-1>.
- Perry, Bruce D. 2009. “Examining Child Maltreatment through a Neurodevelopmental Lens: Clinical Applications of the Neurosequential Model of Therapeutics.” *Journal of Loss & Trauma* 14 (4): 240–55. <https://doi.org/10.1080/15325020903004350>.
- Perry, Bruce, and Maia Szalavitz. 2017. *The boy who was raised as a dog: And other stories from a child psychiatrist’s notebook - what traumatized children can teach us about loss, love, and healing*. Basic books.

- Phillips, Bernadette, Catriona O’Toole, Sinéad McGilloway, and Stephen Phillips. 2022. “Montessori, the White Cross and Trauma-Informed Practice.” *Journal of Montessori Research* 8 (1). <https://doi.org/10.17161/jomr.v8i1.15767>.
- Phillips, Bernadette. 2022. “Montessori Method, and the Neurosequential Model in Education (NME).” *Journal of Montessori Research* 8 (2): 33–43. <https://doi.org/10.17161/jomr.v8i2.18419>.
- Povell, Phyllis. 2010. *Montessori Comes to America: The Leadership of Maria Montessori and Nancy McCormick Rambusch*.
- Radice, Sheila. 1920. *The New Children*.
- SAMSHA (Substance Abuse and Mental Health Services Administration). 2014. *SAMHSA’s Concept of Trauma and Guidance for a Trauma-Informed Approach*. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Stenhouse, Laurence. 1988. Case study methods. In John. P. Keeves (ed.) *Educational Research, Methodology, and Measurement: an International Handbook*, 1<sup>st</sup> edn. Oxford: Pergamon Press, Sidney, 49-53.
- Thomas, M. Shelley, Shantel D. Crosby, and Judi Vanderhaar. 2019. “Trauma-Informed Practices in Schools Across Two Decades: An Interdisciplinary Review of Research.” *Review of Research in Education* 43 (1): 422–52. <https://doi.org/10.3102/0091732x18821123>.
- Thomas, G. 2021. *How to do your Case Study*. Sage.
- United Nations Convention on the Rights of the Child. UNCRC. 1989.
- Van Der Kolk, Bessel. 2014. *The Body Keeps the Score: Mind, Brain and Body in the Transformation of Trauma*. Penguin UK.

## **CHAPTER 8**

### **Discussion**

The overarching aim of this project was to explore the concept of Montessori schools as ‘healing’ environments, and to translate childhood trauma research into effective trauma-informed educational practice. To this end, three separate but related studies were conducted sequentially, with results and discussions presented earlier in Chapters 4, 5, 6, and 7, in the form of papers which have been either published or are under review. An extended discussion on the implications of the collective findings from all three studies is included in this chapter which comprises 5 sections.

As previously described in Chapter 1, the specific objectives of the research were: (1) to examine archival data on Montessori schools as ‘healing’ environments and integrate this historical evidence with the contemporary knowledge base on trauma, and trauma-informed education; (2) to develop a new professional development programme (The “Tipping the Scales” Programme TSP) to support Montessori and early childhood teachers in implementing Montessori-attuned, trauma-informed practice; and (3) to evaluate the feasibility and perceived effectiveness of the programme, in terms of any changes in the knowledge, attitudes, beliefs, and professional practice of participants, at one test school in Ireland. The key findings from all three studies are outlined below.

#### **8.1 Summary of Key Findings**

The key findings from Study 1, which assessed the historical ‘healing environment’ evidence underpinning the Montessori approach, revealed that: (a) Montessori had a long involvement with trauma-affected children during an approximately 19-year period (circa 1897/8 - 1917); (b) the Montessori approach facilitated healing from the effects of adversity



and trauma; and (c) that Montessori attempted to create an intensive, interdisciplinary course for teachers and nurses, which would include instruction on special methods of education (the Montessori method) to help them to understand the psychological characteristics particular to trauma-affected children, and support them to help these children. The collective findings from Study 1 demonstrate considerable evidence to support the claims from eyewitness accounts, media reports, and Montessori's own accounts, that Montessori offered a 'healing' environment.

Study 2 involved a comparison of historical evidence from the Montessori model (gathered in Study 1) with contemporary evidence from the NMT and NME (Perry & Graner, 2018), to explore alignments and commonalities between them. As indicated earlier in Chapter 3, the data on the NMT and NME were gathered from multiple sources. In brief, the findings from Study 2 demonstrated that (a) both the Montessori model and the NME model are biologically respectful and developmentally sensitive approaches to learning; (b) there is an alignment between the *Regulate, Relate and Reason* phase of the NME and the Montessori model; and (c) there are significant commonalities between these models, especially in relation to issues such as - relationships, rhythmic activities, repetition, relevant learning, rewarding learning, and respect. The historical and contemporary evidence was appraised, integrated, and subsequently used to inform the development of a new CPD programme of Montessori-attuned, trauma-informed practice - the (TSP). The framework for effective CPD created by Desimone (2009) was employed in the design of the CPD programme.

As outlined earlier, the third and final piece of work (Study 3) involved a case study at a host school in Ireland in which 11 teachers participated. Briefly, the findings from this case study provided initial promising indications that the new Montessori-attuned TIP programme was considered to be feasible and had led to positive changes in teacher knowledge, attitudes, beliefs, and professional practice in relation to trauma-affected children.

## 8.2 The Implications of the Findings for Contemporary Practice

The findings reported here have a number of important implications in terms of (a) identifying the key processes that facilitate healing in Montessori schools and (b) highlighting the need for Montessori-attuned TIP programmes in early childhood settings. Each of these is discussed, in turn, below.

### 8.2.1 Key Processes that Facilitate Healing in Montessori schools

The findings from all three studies on which this research was based, identified a number of factors and processes that appear to be key to promoting healing from trauma and are characteristic of quality Montessori schools both historic and contemporary. These are: ‘Relationships’, ‘Regulation’ (through engagement in repetitive, rhythmic activities including music/claywork/artwork), ‘Concentration’, ‘Mindfulness’, and ‘Exposure to nature’. Each of these are outlined below.

**Relationships.** One of the most important findings from both Study 1 and Study 2 was the shared emphasis by Montessori and the NME on the centrality of positive supportive relationships in the healing of trauma (Montessori, 2013/1917, 1936; 1967; Perry & Szalavitz, 2006/2017). As described earlier in Chapter 2, contemporary trauma theory emphasises the importance of rich relational milieu in the healing of trauma (Alexander, 2019; Jennings, 2019; Ludy-Dobson & Perry, 2010; Perry & Graner, 2018; Treisman, 2017; van der Kolk, 2014; Wright, 2023). As Study 2 demonstrated, the Montessori model and the NME share several commonalities including, in particular, their emphasis on the need for schools to be relational, (i.e., promoting a sense of kinship) (Montessori, 1936, 1964, 1967; Perry & Graner, 2018) in order to facilitate healing from trauma. Similarly, the “Relate” phase of the NME’s Sequence of Engagement (which aligns with Montessori practice) is crucial in the process of supporting trauma-affected children (Bomber, 2020; Perry & Ablon, 2019).

As outlined in Chapter 2, the need for an emotionally attuned adult to ‘relate’ non-judgmentally with a trauma-affected child is central (Alexander, 2019; Perry & Szalavitz, 2017; Sorrels, 2015; Treisman, 2017). Perry argues that humans are ‘relational’ creatures, and indeed, since our appearance on earth, we have been neurobiologically programmed to relate to others because our very survival as a species depends upon it (Ludy-Dobson & Perry, 2010). Montessori recognised this human need and intentionally responded to it from the outset of her work with children.

The findings from Study 1 demonstrate how Montessori invested considerable time and effort in helping the children with whom she first worked (in the psychiatric hospital in 1897), to feel welcomed and wanted in her clinic (for children with developmental difficulties). Similarly, during her professorship, in her lectures to student teachers, she emphasised that love for the human child (Montessori, 1913) must be their greatest priority. As Study 2 highlights, throughout her long career, Montessori strove to prioritise relational neurobiology by recommending as a core principle, that her schools have a mixture of ages, peer teaching, and an emotionally attuned teacher to promote collaboration and love between the children, their peers, and their teachers (Montessori, 1936, 1964, 1967). Additionally, in Study 3, one of the findings centred on the participants’ emerging recognition (during the course of attendance at the programme) of the importance of positive, relational interactions in the healing of trauma and indeed this is widely supported within the wider literature (Alexander, 2019; Ludy-Dobson & Perry, 2010; Treisman, 2017; Wright, 2023). Thus, the three independent studies highlight the importance of positive relational interactions in the healing of trauma, and offer important lessons for contemporary practice in this regard.

**Regulation.** One of the most striking findings from both Study 1 and Study 2, is the emphasis in both models on the use of “patterned, repetitive, rhythmic” activities (Perry, 2009, p. 243), and the finding that these have a positive effect on the regulation of the stress response

systems. In the case of the NME, these activities are used deliberately and overtly as neuroscientifically based strategies to help regulate the stress response systems (Perry and Graner, 2018). In the case of the Montessori model, these activities were purposively used because Montessori's meticulous observations of children showed her that patterned, repetitive activities, appeared to help children to become calm and happy (Montessori, 1936, 1964, 1967). Although Montessori does not use the same terminology as Perry and the NME (i.e., she does not state that repetition helps to regulate the stress response systems), she, and the many eyewitnesses to her early schools, noted that the repetitive activities with which the children were constantly engaged, helped them to become "tranquil" (George, 1912), calmed their "nervous systems" (Stevens, 1912; Tozier, 1911) and left them with the appearance of being calm and happy (Montessori, 1936).

Furthermore, in Study 3, contemporary teacher feedback also confirmed that children engaging in patterned, repetitive, and rhythmic practical life activities, (such as laying tables with mats, napkins, and cutlery, for lunch), were perceived by independent observers, to have reduced anxiety (e.g., the children were calm, smiling, happy, and relaxed).

The findings from Study 1 specifically reveal that activities such as: moving to music and group singing, clay work, and artwork (especially colouring and drawing), all of which involve "patterned, repetitive, rhythmic, activity" (Perry, 2009, p. 243) were utilised by Montessori to good effect in terms of calming and regulating anxious or dysregulated children and especially those who had been affected by traumatic experiences. The teachers who participated in Study 3 also noted the importance of movement and rhythmic activities to promote regulation (of the stress response) in children. The science behind these three types of regulating activities is briefly explained below.

***Moving to Music and Group Singing.*** The findings of Study 1 suggest that Montessori's use of music and movement and group singing in her schools had a therapeutic effect (Bailey,

1915). Indeed, recent research shows that moving to music or active music-making such as singing, playing a musical instrument, or even composing music electronically, can lead to the release of neurotransmitters such as dopamine, a feel-good chemical that influences concentration, memory, mood, and motivation (Ferreri et al., 2019). Indeed, this research shows that music making can also activate the release of serotonin, a chemical that influences anxiety levels, pain sensitivity, and mood. Singing has also been shown to reduce the levels of cortisol, the stress hormone in the body and produce a feeling of relaxation through the breathing patterns involved in producing song (Fancourt et al., 2015). Moreover, the hormone oxytocin, which is associated with social bonding is released when people sing in a group and helps to make individuals feel connected to others (Good & Russo, 2022). This is particularly important for children and young people who are trauma-affected because it helps to offset the feeling of being disconnected or separate from others which is frequently felt by children who have been exposed to trauma (Craig, 2016).

The Study 2 findings further indicate that the NME recommends the use of rhythmic activities (which would include moving to music) in schools to help trauma-affected children to regulate their stress responses (Perry & Graner, 2018). In Study 3, participants agreed that a state of calm in dysregulated children can be promoted through the use of rhythmic activities such as music making. Several participants discussed how drumming was effective in calming one particular child who was prone to becoming dysregulated. Thus, the findings from all three studies – consistent with the literature (e.g., Fancourt et al., 2015; Ferreri et al., 2019) point to the power of music to bring regulation to anxious or dysregulated children. This suggests that teachers in contemporary Montessori schools, may need to be more proactive in harnessing the power of music to support trauma-affected children by reducing their overall levels of stress.

***Clay Work.*** The results from Study 1 indicate that the early Montessori school teachers frequently facilitated work with clay and were aware of its capacity to calm children

(Cromwell, 2006/1916). Indeed, recent contemporary research highlights the benefits of working with clay for trauma-affected children (Elbrecht, 2021). In an older but insightful study, Heimlich and Mark (1990), describe how working with clay can mitigate the feelings of helplessness frequently felt by trauma-affected children. They explain that when even timid children engage in clay-work which involves handling, manipulating, and sculpting a shapeless lump of clay, they immediately feel empowered and, in turn, can quickly come to understand their own efficacy. Sholt & Gavron (2006), in a more recent and equally insightful study identified six major therapeutic factors that emerge through the use of clay work including: (1) the expression of emotions; (2) cathartic release; (3) the bringing of repressed memories into consciousness; (4) the facilitation of rich and deep subjective expressions; (5) the facilitation of verbal communication; and (6) the embodying of thoughts, feelings, and conflicts into concrete objects (Sholt & Gavron, 2006). Study 2 indicates that rhythmic activities, which include clay work “would be organizing and regulating input that would most likely diminish anxiety, impulsivity, and other trauma-related symptoms that have their origins in dysregulation of these (brain stem and diencephalon) systems (Perry, 2009, p. 243). In Study 3, participants agreed that in their practical day-to-day experiences with children, rhythmic activity with clay can calm anxious or dysregulated children.

Perry recommends that in traditional schools, teachers should intersperse rhythmic activities between the lessons throughout the day to give children a chance to keep their stress responses low (Perry and Graner, 2018). It is significant that in Montessori schools, teachers do not have to do this as an ‘add-on’ because rhythmic activities are freely available throughout the day in the form of either practical life tasks such as sweeping a courtyard, or cultural activities such as moving to music, or working with clay. In this respect, historical and contemporary evidence on how to use rhythmic activities to regulate the stress response, can

be integrated (and in this project, were integrated) in the design of a contemporary Montessori-attuned, trauma-informed CPD programme.

***Rhythmic Artwork.*** The Study 1 findings also support the possibility that many trauma-affected children in the early Montessori schools used rhythmic artwork, especially colouring and drawing as a form of therapeutic support to process their experiences. Trabalzini (2013) notes that the annual reports of some Montessori schools, compiled during the WW1 years, record that children's drawings reflected images of the war, and she adds that some teachers specifically recorded that the children repetitively drew and coloured in, pictures of weapons, army trucks, planes, soldiers, and zeppelins (Trabalzini, 2013). The children clearly felt a psychological need to process their experience of the intrusion of weapons, army trucks and other war related machinery into their lives, and they used drawing and colouring, rather than speech, as a means of processing these frightening experiences. Likewise, Haring et al., (2020) argue that young children often are simply not capable of verbalising their fears, frustrations, or sense of distress, and that incorporating these into their drawings and paintings may help them to alleviate or overcome their distress and trauma. These authors also state that the very actions involved in creating art (repetitive hand movements) appear to be part of the healing process for children as much as it is an expressive practice for them (Haring et al., 2020). These insights support the findings in Study 2 that "patterned, repetitive, rhythmic activity" (Perry, 2009, p. 243) sends neural input to the brainstem and other lower brain areas where the dysregulation originates, and promotes regulation. Perry often describes how he sat alongside a trauma-affected child and just coloured a picture (using repetitive movements) while the child coloured theirs (Perry & Szalavitz, 2017), remaining silent much of the time.

**Concentration.** An important finding in Study 1 (which is recorded in the JMR article in Chapter 4) was Montessori's discovery of the phenomenon of deep concentration which appeared to promote a notable calmness and tranquility in children (Montessori, 1936). Early

on in her work with the impoverished children of San Lorenzo, (1907), Montessori became fascinated by this phenomenon which she witnessed repeatedly. She noticed that when the children found a material or exercise/activity in which they were interested, they frequently became so immersed in the activity that they repeated it over and over again and sometimes, they went into such a deep state of concentration that they became unaware of their surroundings. This phenomenon of deep concentration on a task, to the extent that the child becomes oblivious to the presence of others, followed by an observable state of happiness, was noted by many eyewitnesses to Montessori's early classrooms (Fisher, 1912; George, 1912; Tozier, 1911). In Study 3, contemporary teacher feedback also confirmed that deep concentration on a task promoted calm and tranquility in anxious or dysregulated children.

In her book *The Absorbent Mind* (1967), Montessori discusses this phenomenon of deep concentration that she first observed at the outset of her career, in most of the children in her schools, many of whom were trauma-affected. She described it as a transition from one state (a perturbed or uneasy state) to another (a calm and peaceful state) following deep engagement in a self-chosen exercise or activity. She stated that this passage from one state to another in children, always follows the same pattern which involves engagement with a piece of work, done by the hands, with real objects, and accompanied by deep mental concentration (Montessori, 1967). She found that this phenomenon of deep concentration was repeated unflinching in children in all of her schools, regardless of their socio-economic or ethnic background (Montessori, 1967). It is also notable that she regarded the discovery of this phenomenon as the most important discovery in her entire body of work (Montessori, 1967).

Montessori described this phenomenon as a “moment of healing” (Montessori, 1967, p. 206) and she frequently used the words “healing,” (p. 206, 207), and “cure” (p. 204, 205, 206), in this regard. She wrote – “This psychological event, which brings to mind the cure of adults by psychoanalysis, we have called by the technical term *normalisation*” (p. 204).



Montessori understood ‘normalisation’ to be an “integration” (p. 203) in the child’s mind which had a positive transformative effect on the child such that it was visible to onlookers. She wrote that the phenomenon she came to call ‘normalization through work’ comes about through deep concentration on a piece of work that provides just the right amount of challenge to maintain the child’s interest, and provoke repetition, which in turn promotes concentration. In Study 3, several participants referred to the calm that came over anxious children when they engaged in self-chosen activities, accompanied by deep, mental concentration, such as, for example, folding tea-towels; sorting cutlery, washing, drying and stacking dishes; or other activities involving work with real objects, such as, for example, painting small wooden gift boxes, or icing little tea-cakes. Therefore, the phenomenon that Montessori witnessed decades ago, and which she described in detail (Montessori, 1967) still occurs when the teacher facilitates its occurrence by providing suitable activities, and allowing the child to work uninterrupted, until they feel the inclination to stop.

As mentioned in Chapter 2, over the last two decades, the similarities between Montessori’s discovery of this phenomenon which she called ‘normalisation through work’, and the phenomenon of “Optimal Experience” or “Flow Theory” pioneered by the psychologist Mihály Csíkszentmihályi (Csíkszentmihályi, 1990), have been closely examined (Rathunde, 2023; Rathunde, 2015, Rathunde & Csíkszentmihályi, 2005). According to Rathunde (2023), the word ‘flow’ describes a block of time when an individual is so fully absorbed and concentrated on a task that they become oblivious to the passage of time, and are motivated from within to work on the task because of the enjoyment they receive from simply engaging in the activity (Rathunde, 2023). Rathunde says that when we compare flow theory with Montessori education it is clear that flow is an essential element of Montessori pedagogy (Rathunde, 2023). He adds that Montessori’s descriptions of the deep concentration she witnessed in children, are very close to the research-based descriptions of the characterisations

of the flow experience such as absorbed attention and deep concentration which isolates a child from all the distractions of their environment (Rathunde, 2015).

With regard to trauma, the possibility that flow could be healing for trauma-affected individuals is just beginning to be investigated in contemporary research and with potentially important implications. Despite the fact (as stated above) that Montessori was using the words *healing*, *cure* and *integration* of the mind in relation to the ‘normalisation’ phenomenon decades ago, the possibility that deep concentration on a task could be healing for trauma-affected children or adults is a relatively new concept in contemporary literature on trauma. It may well, in time, prove to be a significant concept in the development of approaches aimed to support trauma-affected children, and if so, the Montessori approach may play a central role as a means of promoting the ‘flow’ experience in children in schools.

**Mindfulness, and Exposure to Nature.** The Study 1 findings further suggest that the early Montessori teachers regularly used what we would now refer to as ‘mindfulness’ activities (Lillard, 2011). Specifically, the ‘Silence Game’ and the ‘Walking on the Line’ activity as described in Chapter 4, both appear from the eyewitness testimonies, to have been helpful in producing a state of calm in the children, and so may have been instrumental at least in part, in promoting psychological recovery in children who were struggling with the effects of their exposure to traumatic events. Additionally, close examination of many Montessori materials/activities reveals that there is a ‘mindfulness’ element built-in to most, if not all of them. This is not an ‘add on’ but rather, it is something integral to the carefully designed activities. For example, this might involve the precision of movements required in practical life activities such as polishing silver or cleaning the leaves of a delicate plant. It also may involve the close discrimination required for making the microscopic distinctions between sights, sounds, tastes, or smells, that is involved in some of the activities. Lillard, (2011) points out that in conventional schools, activities which draw attention to precision of movement, and fine

distinctions in sensory experiences, are not typically part of the curriculum and yet these activities constitute a form of mindfulness.

Essentially, this suggests that a child in a Montessori environment is literally engaged in mindfulness activities for the greater part of the day. This idea has important implications in relation to trauma-affected children. Contemporary research on trauma highlights the important role of mindfulness for trauma survivors because it has been found to help survivors by facilitating the process of recognising the (often quite sudden) ebb and flow of emotions and physical sensations following exposure to trauma (Nicholson et al., 2023). Thus, the integration of mindfulness into the everyday activities in contemporary Montessori schools, is likely to assist in efforts to support trauma-affected children.

The findings in Study 1 also indicate that Montessori placed a considerable emphasis on nature and the outdoors as a fundamental requisite for good mental and physical health. From the outset of her work, as eyewitnesses attested, she encouraged her teachers to facilitate outdoor lunches, outdoor work with Montessori materials, gardening, growing vegetables and fruits, looking after small animals, and plenty of free play in the outdoors (White, 1914). Later on, Montessori also encouraged outdoor naps in hammocks, where possible. As described in Chapter 2, contemporary research suggests, likewise, that outdoor activities can have therapeutic benefits for children who have been exposed to adversity or trauma (Mulholland & O'Toole, 2021). An important benefit for trauma-affected children, of engagement in outdoor activities, is that these help to normalise heart rate and blood pressure, which are frequently found to be elevated by exposure to trauma (Sorrels, 2015). They also reduce cortisol (the stress hormone), increase vitamin D, improve sleep quality, and increase overall wellbeing (Trovato, et al., 2023). In Study 3, contemporary teachers spoke about their enclosed outdoor garden, to which the children have free access, and how this was considered to have a calming effect on

anxious children. Thus, all three studies, highlight the importance of mindfulness and exposure to nature in the healing of trauma.

In summary, the findings reported here, identify the processes that initially facilitated healing in Montessori's early schools and still have the capacity to facilitate healing in contemporary Montessori schools. With this knowledge comes responsibility, specifically the responsibility to integrate this knowledge into a contemporary Montessori-attuned, TIP programme. This will be discussed below.

### **8.2.2 *The Need for Montessori-attuned TIP Programmes.***

The findings from all three Studies identified several reasons why it is important for Montessori teachers to participate in Montessori-attuned TIP programmes. These reasons include: (a) the paucity of information provided in current Montessori teacher training courses relating to three issues namely - Montessori's work with traumatised children; childhood trauma; and TIP; (2) the similar paucity of information in such courses on - how TIP principles operated in Montessori's early schools; (3) the need for an understanding of the centrality of respect for children, families, and cultures; and (4) the need to build on Montessori's important early work. Each of these is described in more detail below.

**The Paucity of Information on Trauma in Montessori Training Courses.** The findings in this research, especially from Study 3, revealed firstly, that contemporary Montessori teachers (in this case, in the Irish context) received little or no information in their Montessori training courses about Montessori's historical involvement in supporting trauma-affected children, and her efforts to set up free trauma courses to support teachers and nurses to help trauma-affected children. However, the findings (especially from Study 3) also revealed that participation in the newly developed Montessori-TIP programme, greatly enhanced their knowledge of Montessori's involvement with trauma-affected children, and her approach to

helping these children to recover. The participants perceived this knowledge to have been instrumental in improving their professional practice.

Secondly, the findings from this research, especially from Study 3, revealed that contemporary Montessori teachers (in this case, in the Irish context) received little or no information in their Montessori training courses, on childhood trauma, and TIP. As described earlier in Chapter 2, childhood adversity and trauma are common, are found in every socio-economic group (Felitti et al., 1998), and are so prevalent that they have been described as a major public health concern (van der Kolk, 2014). Therefore, it is crucial for Montessori teachers in training and practicing Montessori teachers to be knowledgeable about trauma and understand its potential effects on the emotional social and cognitive functioning of children, and to be aware of children's adaptive responses to trauma which may involve behaviours which can (mistakenly) appear to be either disruptive or withdrawn behaviours. Similarly, it is important for Montessori students and teachers to be knowledgeable about TIP, and strategies that are currently being suggested to support trauma-affected children. The findings in Study 3 of this research project, revealed that all of the participants (self) reported increases in their knowledge on trauma and TIP post programme attendance, and once again, their perception was that this knowledge helped to improve their professional practice. Evidence from Study 1 reveals that in the early schools, many Montessori teachers were aware of the signs of trauma in children, (Bailey, 2015; Cromwell, 2006/1916; Montessori, 1936, 1967; Trabalzini, 2013), and responded with compassion and understanding, often employing approaches that would now be recognised as embodying key (TIP) principles. Further discussion on these is provided below.

**The Need for Knowledge on 'TIP Principles' in the Early Schools.** The Study 1 findings indicate that the original Montessori approach employed approaches that would now be recognised as embodying the key principles of trauma-informed practice (TIP). These

approaches emphasise - *safety, trust, peer support, collaboration, and empowerment* (SAMSHA, 2014). The Study 1 findings show that Montessori ensured physical and psychological *safety* by using several practices such as - the promotion of positive relational interactions, the abolition of rewards and punishments, the use of self-correcting materials, and the facility for individual activity. She promoted *trustworthiness* and *transparency* in her schools by establishing an ‘open-door’ policy whereby parents were invited to come into the school any time they wished, and visitor passes were given to interested parties from all walks of life, who also wished to observe the classes at work. She even created a ‘Glass-Classroom’ at the San Francisco Panama-Pacific International Exposition in 1915, where hundreds of observers witnessed the daily routines in her glass-walled demonstration classroom (which opened with 30 children, who had never previously attended any form of school). She promoted *peer support* by eliminating the competitive spirit between peers and replacing it with the collaborative spirit. She promoted *collaboration* by having mixed age-groups and peer teaching. She promoted *empowerment* by facilitating real choices for children and instructing her teachers to listen to the children’s voices and opinions, and to identify and build on children’s strengths, so that they became masters of themselves (Montessori, 1936; 1967). This arguably played a major role in promoting their recovery from exposure to traumatic experiences. One important implication for contemporary Montessori teachers is that they need to have a knowledge and understanding of TIP principles and apply them in their daily practice.

The findings of Study 2 provide important neuroscientific explanations underpinning some of these TIP principles. For example, when Montessori ensured physical *safety* by abolishing punishments, and psychological *safety* by reducing or even eliminating bullying (White, 1914), she effectively created contexts in which the children felt safe and were therefore in a state of calm. Additionally, by promoting positive relational interactions, and facilitating mixed age groups and peer teaching, she helped children to feel safe, thereby

reducing the risk of a stress response activation and its attendant cascade of chemical reactions, (via the amygdala, the brain's fear centre). Therefore, some of the findings in Study 1 are explained neurobiologically by the evidence in Study 2. Additionally, in Study 3, the feedback from the teachers indicates that the children, including refugee children, were helped to 'feel like they belonged' and supported to 'feel safe' by being welcomed into the 'community' of the school. The neuroscientific principles underlying the NME show that this sense of belonging promotes a feeling of *safety* in individuals (Perry & Graner, 2018). Importantly, examining the three studies together provides further information on how the TIP principles in Montessori's early schools affected children, promoting their healing from trauma, therefore offering potentially important lessons for contemporary practice.

**The Centrality of Respecting Children, Families, and Cultures.** Amongst the most important findings of both Study 1 and Study 2 was the emphasis placed by both the NME and the Montessori model, on the need for schools to understand the centrality of respecting not only their students, but their students' extended families, and their cultures. The NME highlights that to ignore or disrespect someone's culture, could be traumatising or re-traumatising for that individual or group (Perry & Graner, 2018). The term culture refers to the customs, traditions, beliefs, values, and behaviours of a particular religious, ethnic, or social group. Study 2 reveals that the Montessori approach, since its inception, has always acknowledged and respected diverse cultural traditions and customs, and in practice made them an integral part of the Montessori approach. Brunold-Conesa (2020) points out that the Montessori integrated history/geography curriculum known as the *fundamental needs of humans* helps children to understand that all people, on every continent, throughout the history of humankind, had and still have, the same basic needs. Likewise, Lillard and colleagues (in press) state that the Montessori approach aligns with culturally responsive pedagogy (CRP). In addition, since theoretically, the Montessori approach is rooted in *respect* for every human

being, regardless of race, religion, gender or colour, a thoughtful and respectful approach to multi-cultural practices has always been one of its foundational principles.

Throughout her life, Maria Montessori worked in many countries and embraced them respectfully and regarded herself as a citizen of the world. In contemporary Montessori schools, the diverse cultures of the students and their families are usually celebrated through art, music, dance and often the cooking of foods particular to a specific culture followed by the sharing of the meal later on with the children/young people and their families. Books, photographs, and artifacts representing the countries and cultures of the children and families attending the schools are proudly displayed in corridors in order to help the children and families from these countries and cultures feel welcomed, respected, and above all, feel a sense of belonging.

Historically however, many people of various races, skin colours and creeds have been discriminated against and alienated by others who view their own ethnicity as being superior. The NME explains the toxic stress that can build up when individuals feel a sense that they do not belong, or that they have the wrong skin colour, religion, gender, culture, or background (Perry & Graner, 2018). The NME emphasises that humans are relational beings and inherently social. We are biologically programmed to seek belonging and community. We are directed by our brain to judge whether or not we belong in the environments in which we find ourselves. If, we get a sense from our peers and from our teachers that we belong, we feel safe. If we do not get this sense that we belong, we feel threatened (Perry & Graner, 2018).

In general, quality contemporary Montessori schools go to great lengths to ensure that children and families of every skin colour, culture and creed, are welcomed and are given a sense that they belong to the community they have joined. This was evident in the case study conducted in Study 3. Genuine (appropriate) welcoming actions by teachers and other school staff can have hugely positive effects. The NME emphasises that, although typically, teachers can feel helpless when faced with the enormity of the problems associated with race, multi-



cultures, diversity and inclusion, simple practices, such as helping children and their families to feel that they belong, can be hugely beneficial. By showing respect for the diverse cultures of children and welcoming them and their diverse heritages into the Montessori community, teachers can go some way towards protecting these children and their families from the toxic stress associated with feeling that they do not fit in (Perry & Graner, 2018). Contemporary Montessori teachers have the potential to help children and their families to feel welcomed and cared for. Teachers may not share the same language, skin colour, culture or traditions of the people who come to their classrooms, but they share the same need to feel loved, to belong, to be part of a community. This is what Montessori emphasised when she wrote about the children in her first school, and how she made them feel wanted and welcomed (Montessori, 2008).

However, it must be acknowledged that respect for all children, their families and cultures cannot be automatically guaranteed in every Montessori school. Brunold-Conese (2022) writes that although DEI (Diversity, Equity & Inclusion) and ABAR (Anti-Bias, Anti-Racism) are intrinsic to Montessori philosophy, they are not always put into practice in every classroom. She adds that although the terms DEI and ABAR were historically not part of Montessori's lexicon, the principles they embody are central to Montessori's basic philosophy, and arguably if Montessori were alive today, she would advocate for their place in her educational model.

In a timely publication entitled, *Equity Examined* (2023), Wafford and Debs (2023) indicate that there is a long history of structural racism in the world including in the United States. They address the question of how Montessori schools stand in the midst of this, and question whether they have a special status as an anti-bias, anti-racism form of education, as many Montessori educators believe. They argue that the Montessori approach is not automatically an anti-bias, anti-racism method and that Montessori educators have a duty to

educate themselves about racism in their own countries and beyond and subsequently change their practices for the better.

Slade (2021) also urges us to examine our attitudes and policies to ascertain if they are (even inadvertently) promoting structural racism. She writes that awareness of racial identity begins in the first six years of a child's life and that by six years of age, children of colour are aware of their racial group and the negative stereotypes associated with it. She argues that because of this racial awareness in young children, adults' awareness of racial issues and willingness to talk about them in Montessori classrooms is important. She says that honest conversations are needed to examine, and turn around, the silent beliefs that underly inequity (Slade, 2021).

With regard to respect for inclusion in Montessori classrooms, Moss and Epstein (2023) refer to research showing that both typically developing children and those with disabilities living in the US, are benefitting from Montessori schools that are inclusive, while typically developing children who attend inclusive schools see differences among their peers as something completely natural (Moss and Epstein, 2023). The findings in Study 2 relating to the importance of schools showing respect for children, their families and their cultures, suggests that the NME and the Montessori approach are aligned in theory, but not always in practice. Therefore, there is a need for contemporary Montessori teachers to engage in Montessori-attuned TIP programmes so that they become aware of the toxic stress that can be caused to children, and their families if they, their families and their cultures are not genuinely respected.

**The Need to Build on Montessori's Early Work.** In Study 1, it was reported that Montessori's attempts to set up a programme for teachers and nurses to increase their knowledge and understanding of psychological trauma in children (as part of the White Cross) was not successful due to a lack of financial support. However, the Study 3 findings provided

initial promising indications that the new Montessori-attuned, TIP programme (TSP) can have a positive impact on teachers and improve their knowledge, attitudes, beliefs, and professional practice in relation to trauma-affected children. The contemporary Montessori/early childhood teachers who participated in Study 3, referred to their experience of participating in the programme, as ‘transformational’, providing them with a new way of working which helped them to see children through a trauma-informed lens. The teacher feedback from Study 3 indicated that by providing knowledge about the neurobiology of trauma, and its effects on the emotional, social, and cognitive functioning of children (which frequently manifests as negative behaviours in the classroom), teachers can be better supported to avoid misjudging children and believing that their behaviours are caused by defiance or willfulness, when in fact, they may be caused by processes more to do with the effects of trauma. Without this knowledge, teachers often unintentionally mis-label children because their behaviours are misunderstood. Engagement in Montessori-attuned, trauma-informed programmes could potentially help teachers to avoid these misunderstandings of childrens’ behaviours and in so doing avoid re-traumatising them.

### **8.3 Strengths and Limitations of the Research**

This research makes an important and original contribution to knowledge in the field of Montessori research in particular, and trauma-informed practice more generally. The project advances the field of Montessori pedagogy by blending and integrating contemporary knowledge from a number of diverse fields, including traumatology, psychology, neuroscience, education, and public health, with uniquely, historical accounts of Montessori’s overall philosophy and original pedagogical practices. These practices were examined in detail in Study 1 using three distinct historical sources comprising, eyewitness accounts, media reports, and Montessori’s own accounts of her early schools (circa 1897-1917). All of this added rigor

to the work, whilst providing useful triangulation of the findings (Bowen, 2009). This element of the project addresses a significant gap in the research relating to the role of the early Montessori schools in helping to support the psychological recovery of trauma-affected children, as well as the recognition of Montessori as a mental health expert who promoted mental health and healing from trauma through her unique pedagogical practice. Thus, these findings represent an important contribution to the international literature and knowledge base on Montessori's legacy by re-introducing, and critically re-examining the largely forgotten psychological aspects of her work.

The findings from Study 1 are supported with neuroscientific explanations in Study 2, which focus, in particular, on the ways in which Montessori provided a sense of physical and psychological safety for the children in her care (e.g., by abolishing punishments, providing self-corrective activities, advising on the teacher's non-verbal safety cues such as tone of voice, facial expressions, and general body language). All of these factors mitigated against the activation of the amygdala (ie., the brain's 'smoke alarm') as described by van der Kolk (2014), and the entire stress response system (Wright, 2023) with its cascade of chemical reactions that are described in Chapter 2 and throughout the literature (Bomber, 2020; Burke-Harris, 2019; Nicholson et al., 2023; Treisman, 2017). The collective findings from both Studies 1 and 2 are important in highlighting the potential utility and effectiveness of the Montessori approach (backed up with contemporary evidence) if used in schools to promote positive mental health in children, while also supporting trauma-affected children and preventing their re-traumatisation.

The results from both Studies 1 and 2 were then integrated to inform the development of an innovative and comprehensive, Montessori-attuned, trauma-informed, CPD programme for Montessori and early childhood educators – the (TSP), the initial evaluation of which showed that such approaches can potentially enhance the capacity of contemporary Montessori

and early childhood educators to support trauma-affected children. This is the first programme of its kind (to our knowledge) that has been developed to support Montessori and early years educators in this way.

The TSP was carefully designed to incorporate elements that have hitherto not been addressed in traditional courses on Montessori pedagogy. For example, as argued in Chapter 5, the alignment between the Montessori model and acclaimed NME (Perry & Graner, 2018), which is outlined in detail in the CPD programme, is another key strength of the programme, and could prove to be beneficial and empowering for the thousands of Montessori/early childhood educators globally who are increasingly facing the task of supporting trauma-affected children. For these educators, a knowledge that the Montessori model shares both commonalities and alignments with the NME, and is underpinned by the same neuroscientific principles, may boost their confidence in relation to their capacity to support trauma-affected children.

Specifically, the TSP may enhance their interdisciplinary knowledge about the neurobiological implications of trauma, so that they can understand, for example, why repetitive activities work so effectively with trauma-affected children and help them to regulate; and additionally, it may improve their professional practice by giving them a greater understanding of relational neurobiology and why positive relationships are healing for trauma-affected children (Ludy-Dobson & Perry, 2010; Perry & Szalavitz, 2006/2017; Perry & Winfrey, 2021).

Another key strength of the research was the ‘insider’ information perspective, employed by the researcher, who was a Montessori teacher for many years and therefore had an in-depth and nuanced understanding of the challenges for many contemporary schools (especially in Ireland) in terms of maintaining fidelity to the Montessori approach (Williams & Stephens, 2023). In this regard, and as explained in Chapter 7, the rapport and trust built up

carefully and ethically by the researcher with the participants over two semesters were invaluable and led to the participants acknowledging that they felt they were in a ‘safe space’ where they could voice their thoughts and opinions (Carello & Butler, 2015), knowing that their confidentiality was assured, and that the researcher took a non-judgmental stance to their opinions, in relation to issues, including strict fidelity to the Montessori model.

In summary, the strength of the research lies in its capacity to offer new insights and possibilities to facilitate psychological healing in children and young people in both Montessori and other educational environments, both within and outside of Ireland. However, the research was also limited in a number of ways. With regard to Study 1, the documentary analysis was necessarily limited to an examination of accounts of psychological healing in Montessori schools during the period 1897 to 1917. The meticulous nature of the work (and the need to identify and check the reliability and credibility of the available documentation) precluded the possibility of going beyond this timeline, but also, this was the most critical and relevant period in Montessori’s career in terms of developing her approaches to supporting trauma-affected children.

Secondly, Study 2 was limited only to an analysis of the NMT and the NME due to what was considered their similarity to the Montessori approach and their comprehensive and scientific approach. However, future research could examine the applicability of some of the other models mentioned in Chapter 3. Lastly, Study 3 was based only on a case-study approach conducted in a single school with a small sample of largely Montessori trained teachers. Furthermore, all 11 participants were white and female and whilst their profile was similar to the vast majority of staff in other creches and Montessori schools in Ireland, it is not known to what extent the findings would be generalisable to potentially more diverse teacher populations in other countries and jurisdictions.

Arguably however, the ‘thick descriptions’ (Guskey, 2002) reported here provide an adequate level of what Ary et al (2006) described as “descriptive adequacy” (Ary et al., 2006) to enable potential readers to make the necessary comparisons and judgements about the similarities and differences, and ultimately the transferability of the findings to their particular settings. Future research could include more follow-up sessions with the participants (ideally spaced out over a year) to discuss the practicalities, and ease or difficulties in the implementation of the TSP in their classes.

#### **8.4 Recommendations for Future Research, Practice and Policy**

There are a number of possible directions for future research that would help to build on the findings presented here. For example, as mentioned in Chapter 2, contemporary TIP programmes are not without their critics. A number of authors have argued that the concept of trauma-informed care and practice cannot justifiably be separated from issues such as socio-economic status (SES), the social determinants of health, discrimination, racism, and other forms of social oppression (Gherardi et al., 2020; Henfield, 2019). It follows therefore, that the integration of additional modules into the TSP, focusing overtly on anti-bias/anti racism (ABAR), culturally responsive pedagogy (CRP), and social justice in education (SJE), could be instrumental in enhancing the robustness, relevance, and credibility of the CPD programme. The researcher is currently exploring this possibility.

In addition, and as indicated above, future research could examine Montessori schools in the later years from 1917 onwards and include an examination of the effects of Montessori pedagogy on children during World War II. Additionally, it could be beneficial to compare the Montessori approach with other trauma-informed models such as the HEARTS or the HTCL models described earlier in order to identify any additional learnings therein. Lastly the TSP should be evaluated on a larger-scale and ideally within the context of a mixed methods design

comprising, for example, a Randomised Controlled Trial (RCT) and process evaluation and incorporating a greater number of schools and a more diverse sample of participants. An economic evaluation would also be important in terms of assessing the effectiveness of the programme relative to its costs of delivery and implementation, and the potential for generating savings further down the line from any benefits that may accrue from supporting vulnerable children early in their lives.

With regard to practice implications, the findings especially from Study 1, indicate that the original Montessori approach was trauma responsive by its very nature and that this was not seen as an ‘add-on’ but rather it was “woven into the very fabric of the school – the materials, the approaches, the teachers, and the entire school environment” (Phillips et al., 2022, p. 13). One of the key issues here, is the fact that the children were free to select their own activities and engage with them for as long as they wished (Phillips et al., 2022). The implications of this are significant for contemporary Montessori schools if this scenario can be replicated because, currently many Montessori and other early childhood educators often feel ill equipped to support trauma-affected children (Nicholson, 2023). However, if environments are prepared in such a way that a trauma-affected child can select their own activity, whether that consists of a rhythmic, practical task (e.g., raking leaves), therapeutic art activity (e.g., working with clay), engaging in music and movement (e.g., repetitive steps), or a patterned, repetitive, sensorial activity (e.g., matching sounds, smells, tastes), - and, most importantly, if children are allowed to control the number of times they wish to repeat the activity – arguably there is no reason why they should not experience the same psychological healing as the children in Montessori’s early schools.

With this in mind, all organisations involved in the training of prospective Montessori teachers and the provision of CPD for qualified and practicing Montessori and other early childhood teachers, could consider providing a module or part thereof (integrated into their



training courses for prospective teachers, and on a stand-alone basis for qualified teachers) containing the following historical context elements: (a) Montessori's expertise in the area of children's mental health; (b) her work and success in supporting trauma-affected children to heal and recover; and (c) her attempts to set up free trauma courses to help teachers and nurses to support trauma-affected children. Additional information should be provided on childhood trauma (e.g., its possible signs and potential effects on emotional, social, and cognitive functioning), the core assumptions and principles of TIP; and the integration of TIP into the daily practice and operation of contemporary Montessori schools.

The development of a 'train the trainer' programme could also be useful in terms of scaling up this trauma-informed CPD programme or part thereof. Currently, Montessori education is reported to be the largest alternative pedagogy in the world (Debs, 2023) and it is estimated that there are approximately 16,000 Montessori schools globally (Debs et al, 2022; Debs, 2023). This highlights some exciting possibilities in the longer term – and especially following a larger evaluation – in terms of developing online or in person 'train the trainer' courses. As the article (under review) in Chapter 5 highlights, the Montessori approach has an intuitive appeal to all families, regardless of their socio-economic or religious status.

With regard to policy, this research speaks to the need for action on childhood adversity and trauma. PEIN (2019) highlighted that Ireland has no policy on childhood adversity. As stated earlier, considering the increased adversities and stressors that many children confront, especially following the COVID-19 global pandemic and its aftermath (Absher et al., 2021; Taylor, 2021) there is an urgent need for government policy that focuses on childhood trauma and how it can be alleviated. This research highlights how Montessori schools were historically, and could be contemporaneously, environments that have the capacity to promote positive mental health in children, and also help trauma-affected children to recover and thrive. One recommendation for policy arising from this research would be that Montessori education

should be promoted, as there is a perception among Montessori teachers (see Chapter 7) that the Montessori approach is not favoured as much as it used to be by the Irish Preschool Inspectorate since the introduction of Aistear, the National Curriculum Framework, in 2009 (Williams and Stephens, 2023). This researcher is optimistic that this project, especially the TSP will spark renewed interest in the Montessori approach within the ECCE sector in Ireland.

## **8.5 Conclusion**

This research examined historical evidence for Montessori schools as ‘healing’ environments and the potential for contemporary Montessori schools to continue this legacy and act as ‘healing’ environments contemporaneously. The collective findings reported here, strongly suggest that the early Montessori schools were indeed healing environments wherein trauma-affected children experienced psychological recovery on a considerable scale which was attested to by many reliable eyewitnesses. The alignments and commonalities between contemporary trauma theory (especially the NME) and the Montessori approach add considerable support to this notion and highlight opportunities for learning and positive change in the ‘here and now’. The findings also indicate that historical and contemporary evidence can be effectively integrated to develop a CPD programme (the TSP) of Montessori-attuned, trauma-informed practice that has some promising initial evidence of effectiveness in terms of improving knowledge, attitudes, beliefs, and professional practice, although future work is needed to evaluate this on a larger scale.

In an era when exposure to adversity and trauma in childhood has been shown to be common and pervasive (Felitti et al., 1998), the overall findings from the three studies which were conducted as part of this research, are important. As stated in Chapter 5, there is a need for the intentional creation of strategies to support trauma-affected children. Montessori schools are ideally suited to do this because, as stated in the collective findings, they already

have the built-in infrastructure to provide trauma-affected children with neurobiologically-based strategies to help them. These strategies include: firstly, focusing on activities that are rhythmic and regulatory; secondly, encouraging mindfulness which is infused into so many Montessori activities; thirdly, spending time in nature because of its potential to heal by reducing stress hormones such as cortisol; fourthly, promoting relational richness through the facilitation of mixed age groups, peer teaching, and what Montessori called ‘spiritually prepared’ teachers (Montessori, 1936, 1967) (i.e., soul-searching, reflective, and emotionally attuned to children).

In conclusion, this research is rooted in the researcher’s 30 years of practice as a Montessori teacher. During this period, it would appear that there has been an increase in the stresses and anxieties experienced by children. For example, the recent COVID-19 global pandemic left many children and families psychologically affected from the loss of family members or friends, to the loss of jobs, housing, or finances (Absher et al., 2021; Taylor, 2021). For those who did not lose these things, there was still a profound sense in most of us, of our precarity in this world. It would perhaps be naïve of us to think that this would not have had an impact on our children. Arguably therefore, in the face of these stressors, children are more in need than ever of schools that focus on the promotion and protection of mental health, and the weaving of these into their daily practices. Montessori schools have been, and still can be, such environments. It is perhaps fitting, therefore, to repeat once again the words of Dr Maria Montessori as recorded by her friend and first biographer:

*“Our schools, ... may be compared in the first place to sanatoria; for the first thing that happens in them is that the children are restored to mental health.”*

E. M. Standing, *Maria Montessori: Her Life and Work*. (1957), p. 178.

## References

- Absher, L., Maze, J., & Brymer, M. (2021). The traumatic impact of COVID-19 on children and families: Current perspectives from the NCTSN. Los Angeles, CA, and Durham, NC: National Center for Child Traumatic Stress.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (2015/1978). *Patterns of attachment: A psychological study of the strange situation*. Psychology press.
- Alexander, J. (2019). *Building trauma-sensitive schools: Your guide to creating safe, supportive learning environments for all students*. Brookes.
- Allen, R.E. & Oliver, J.M. (1982). The Effects of Child Maltreatment on Language Development. *Child Abuse and Neglect*, 6:299-305.
- Ary, D., Jacobs, L., Razavieh, A & Sorensen, C. (2006). *Introduction to research in education*. (7<sup>th</sup> edition). Thomas Wadsworth, Belmont.
- Babini, V. (2000). Science, feminism and education: The early work of Maria Montessori. *History Workshop Journal*, 49(1), 44–67. <https://doi.org/10.1093/hwj/2000.49.44>
- Babini, V., & Lama, L. (2000). *Una Donna Nuova: Il Femminismo scientifico di Maria Montessori*. Milano, Italy: Franco Angeli.
- Bailey, C. S. (1915). *Montessori children*. Holt
- Barnardos. (2020). Supervision in education – healthier schools for all: Barnardos Scotland report on the use of professional or reflective supervision in education. Trauma-informed schools – paper No. 2. <https://www.barnardos.org.uk/files/uploads>
- Begle, A. M., & Dumas, J. E. (2011). Child and parental outcomes following involvement in a preventive intervention: efficacy of the PACE program. *The journal of primary prevention*, 32(2), 67–81. <https://doi.org/10.1007/s10935-010-0232-6>

- Bellis, M. A., Hughes, K., Ford, K., Ramos Rodriguez, G., Sethi, D., & Passmore, J. (2019). Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis. *The Lancet. Public health*, 4(10), e517-e528.  
[https://doi.org/10.1016/S24682667\(19\)30145-8](https://doi.org/10.1016/S24682667(19)30145-8)
- Blodgett, C. & Dorado, J. (2019). A selected review of trauma-informed school practice and alignment with educational practice. <https://s3.wp.wsu.edu/uploads/sites/2019/12>
- Bloom, S. L. (2004). Neither liberty nor safety: The impact of trauma on individuals, institutions, and societies. Part 1. *Psychotherapy and politics international*, 2(2).78-98
- Bloomberg, L.D. & Volpe, M. (2019). *Completing your Qualitative Dissertation: a roadmap from beginning to end*. SAGE.
- Blueknot Foundation. <https://www.blueknot.org.au>.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Bowlby, J. (1969/82). *Attachment*. Basic Books.
- Boyd, W. (1917). *From Locke to Montessori: A critical account of the Montessori point of view*. Harrap & Company.
- Boylan, M., Coldwell, M., Maxwell, B., & Jordan, J. (2018). Rethinking models of professional learning as tools: a conceptual analysis to inform research and practice. *Professional Development in Education*, 44, 120 - 139.
- Braun, V., & Clarke, V. (2022). *Thematic Analysis: A Practical Guide*. SAGE
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Bremner, J. D. (2006). Traumatic stress: effects on the brain. *Dialogues in clinical neuroscience*, 8(4), 445-461. <https://doi.org/10.31887/DCNS.2006.8.4/jbremner>

- Bressan, D. (2012, December 28). December 28, 1908: The tsunami of Messina. *History of Geology*. <https://blogs.scientificamerican.com/history-of-geology/december-28-1908-the-tsunami-of-messina/>
- Brooks, R. (2020). *The trauma and attachment aware classroom: A Practical guide to supporting children who have encountered trauma and adverse childhood experiences*. Jessica Kingsley Publishers.
- Brummer, J. (2021). *Building a trauma-informed restorative school: Skills and approaches for improving culture and behaviour*. Jessica Kingsley Publishers.
- Brunold-Conese, C. (2020). Culturally Responsive Pedagogy: An Intersection with Montessori Education. <https://www.researchgate.net/publication/339828022>
- Brunold-Conesa, C. (2022). Montessori with Integrity – Part 2. DEI and ABAR practices as Essential to Quality Program Implementation. *Montessori Life*. AMS.
- Brunzell, T., & Norrish, J. (2021). *Creating trauma informed, strengths-based classrooms: Teacher strategies for nurturing student's healing, growth, and learning*. Jessica Kingsley Publishers.
- Burke Harris, N. (2019). *The deepest well: Healing the long-term effects of childhood adversity*. Marine Books.
- Carello, Janice and Lisa Butler 2015 “Practicing what we teach: Trauma-informed educational practice.” *Journal of Teaching in Social Work*. Vol 35, (3) 262-278. <https://doi.org/10.1080/08841233.2015.1030059>
- Caven, Meg. 2021. Understanding teacher turnover in early childhood education. Yale school of medicine. <https://medicine.yale.edu/news-article/understanding-ece-teacher-turnover>
- Chandrasekar, R., Lacey, R. E., Chaturvedi, N., Hughes, A. D., Patalay, P., & Khanolkar, A. R. (2023). Adverse childhood experiences and the development of multimorbidity

across adulthood-a national 70-year cohort study. *Age and ageing*, 52(4), afad062.

<https://doi.org/10.1093/ageing/afad062>

Cherry, L. (2021). *Conversations that make a difference for children and young people:*

*Relationship-focused practice from the frontline*. Routledge.

Csikszentmihályi, M. (1990). *Flow*. Harper & Row.

Clarke, D & Hollingsworth, H., 2002. Elaborating a model of teacher professional growth.

*Teaching and teacher education*, 18(8), 947-976.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education* (8th ed.).

London: Routledge.

Cole, S. F., Greenwald O'Brien, J., Gadd, M. G., Ristuccia, J., Wallace, D. L., & Gregory, M.

(2005). *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children,

Trauma and Learning Policy Initiative. <https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>

Cole, S. F., Eisner, A., Gregory, M., & Ristuccia, J. (2013). *Helping traumatized children*

*learn: Creating and advocating for trauma sensitive schools*. Massachusetts

Advocates for Children, Trauma and Learning Policy Initiative.

<https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>

Cole et al., [www.traumasensitiveschools.org](http://www.traumasensitiveschools.org) Part 4.

Cossentino, J. (2016). Montessori schools help children exposed to trauma. In L. Flores Shaw

(Ed.), *The Montessori White Papers, Vol. 2* (pp. 9–16). White Paper Press.

Coster, W. & Cicchetti, D. (1993). Research on the Communicative Development of Maltreated

Children: Clinical Implications. *Topics in Language Disorders*, 13(4): 25-38:31.

Craig, S. E. (1992). The Educational Needs of Children Living with Violence. *Phi Delta*

*Kappan*. 74: 67-71.

Craig, S. E. (2016). *Trauma sensitive schools: Learning communities transforming children's lives, K-5* (Illustrated ed.). Teachers College Press.

Creswell, J.W. and Creswell, J.D. (2018) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage.

Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian refugees. *AMI Communications*, 2, 11-13. (Original work published 1916)

Debs, M. (2019). *Diverse families, desirable schools: Public Montessori in the era of school choice*. Harvard Education Press.

Debs, Mira, Jaap de Brouwer, Angela K. Murray, Lynne Lawrence, Megan Tyne, Candice von der Wehl. 2022. "Global Diffusion of Montessori Schools: A Report From the 2022 Global Montessori Census" *Journal of Montessori Research* 8(2). 1-15. <https://doi.org/10.17161/jomr.v8i2.18675>

Debs, M. 2023. Global Montessori Education. In A. K. Murray, E.-M. Tebano Ahlquist, M. K. McKenna, & M. Debs (Eds.), *The Bloomsbury Handbook of Montessori Education* (pp. 283-289). Bloomsbury Publishing.

Denervaud, S., Christensen, A., Kenett, Y., & Beaty, R. (2022). How school systems shape children's knowledge and creative abilities. <https://npjscilearncommunity.nature.com>

Desimone, L. M. (2009). Improving Impact Studies of Teachers' Professional Development: Toward Better Conceptualizations and Measures. *Educational Researcher*, 38, 181-199. <http://dx.doi.org/10.3102/0013189X08331140>

De Stefano, C. (2022). *The Child is the Teacher*. Other Press.

Dorado, J.S. Martinez, M., McArthur, L. E. & Leibovitz, T. (2016). Healthy environments and response to trauma in schools (HEARTS): A whole school, multi-level, prevention and



- intervention program for creating trauma-informed, safe and supportive schools. *School Mental Health*, 8, 163-176. <https://doi.org/10.1007/s12310-016-9177-0>
- Elbrecht, C. (2021). Healing trauma in children with Clay Field Therapy: How sensorimotor art therapy supports the embodiment of developmental milestones. North Atlantic Books.
- Erwin et al., (2016). Examining the Literature on Authentic Montessori Practices: Multi-Age Groupings. AMS. Research Committee White Paper.
- Evans, L. 2014. Leadership for professional development and learning: enhancing our understanding of how teachers develop. *Cambridge Journal of Education*, 44(2), 179-198.
- Fallot, R. D., & Harris, M. (2009). Creating cultures of trauma-informed care: A self-assessment and planning protocol. *Community Connections*.
- Fancourt, D., Aufegger, L., & Williamson, A. (2015). Low-stress and high-stress singing have contrasting effects on glucocorticoid response. *Frontiers in psychology*, 6, 1242. <https://doi.org/10.3389/fpsyg.2015.01242>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)
- Ferreri, L., Mas-Herrero, E., Zatorre, R. J., Ripollés, P., Gomez-Andres, A., Alicart, H., Olivé, G., Marco-Pallarés, J., Antonijoan, R. M., Valle, M., Riba, J., & Rodriguez-Fornells, A. (2019). Dopamine modulates the reward experiences elicited by music. *Proceedings of the National Academy of Sciences of the United States of America*, 116(9), 3793–3798.

- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2013). Improving the adverse childhood experiences study scale. *JAMA pediatrics*, *167*(1), 70–75.  
<https://doi.org/10.1001/jamapediatrics.2013.420>
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of Adverse Childhood Experiences. *Child abuse & neglect*, *48*, 13–21.  
<https://doi.org/10.1016/j.chiabu.2015.07.011>
- Fisher, D. C. (1912). *A Montessori mother*. Henry Holt & Company.
- Foschi, R. (2008). Science and culture around the Montessori’s first “Children’s Houses” in Rome (1907–1915). *Journal of the History of the Behavioral Sciences*, *44*(3), 238–257.  
<https://doi.org/10.1002/jhbs.20313>
- Fynne, R. J. (1924). *Montessori and her Inspirers*. Longmans; Green and Co.
- Galitch, S. (2021, May 15). *Science—Montessori is good for the brain*. Archyworldys.  
<https://www.archyworldys.com/science-montessori-is-good-for-the-brain/>
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- George, A. E. (1912, July). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping*, *55*(1), 24–29.
- Good A., Russo F. A. (2022). Changes in mood, oxytocin, and cortisol following group and individual singing: a pilot study. *Psych. Mus.* *50*, 1340–1347. doi: 10.1177/03057356211042668
- Grigsby, J., & Stevens, D. W. (2001). *Neurodynamics of Personality*. The Guilford Publications.
- Grossman, P. (2023). Fundamental challenges and likely refutations of the five basic premises of the polyvagal theory. *Biological Psychology*, Vol. 180(2023) 108589  
<https://doi.org/10.1016/j.biopsycho.2023.108589>

- Guskey, T., R. (2002). Professional development and teacher change. *Teachers and teaching* 8(3): 381-91. <https://doi.org/10.1080/135406002100000512>
- Gutek, G., & Gutek, P. (2017). *Bringing Montessori to America: S.S. McClure, Maria Montessori, and the campaign to publicize Montessori education*. University of Alabama Press.
- Haring, U., Sorin, R., & Caltabiano, N. (2020). Exploring the Transformative Effects of Flow on Children's Liminality and Trauma. *Art/Research/International/Journal*, 5(1), 16-46. <https://doi.org/10.18432/ari29492>
- Harris, M., & Falot, R.D. (2001). Envisioning a trauma-informed service system: a vital paradigm shift. *New directions for mental health services*, (89), 3-22. <https://doi.org/10.1002/yd.23320018903>
- Heimlich, E.P. & Mark, A. J. (1990). *Paraverbal communication with children: Not through words alone*. Plenum Press.
- Henfield, M., Washington, A.R., Besirevic, Z. et al. (2019). Introduction to Trauma-Informed Practices for Mental Health and Wellness in Urban Schools and Communities. *Urban Rev* 51, 537–539. <https://doi.org/10.1007/s11256-019-00541-2>
- Herman, J. L. (1997/2015). *Trauma and recovery: The aftermath of violence—from domestic abuse to political terror*. Basic Books.
- Holloway, K., Cahill, G., Tieu, T. et al. Reviewing the Literature on the Impact of Gun Violence on Early Childhood Development. *Curr Psychiatry Rep* 25, 273–281 (2023). <https://doi.org/10.1007/s11920-023-01428-6>
- Horne, H. (1904). *The Philosophy of Education*. Macmillan Press.
- Hughes, D. & Golding, K. (2012). *Creating loving attachments: Parenting with PACE to nurture confidence and security in the troubled child*. Jessica Kingsley

- Itard, J. (1802). *An Historical Account of the Discovery and Education of a Savage Man*.  
Richard Phillips.
- James, W. (1898). Philosophical Conceptions and Practical Results. *University Chronicle*  
*Vol. 1. (4). (September).* p. 287-310.
- James, W. (1907). Pragmatism: A new name for old ways of thinking.
- Jennings, P. A. (2019). *The trauma-sensitive classroom: Building resilience with compassionate teaching*. W. W. Norton & Company.
- Kang, H., Cha, J., & Ha, B.W. (2013). What Should We Consider in Teachers' Professional Development Impact Studies? Based on the Conceptual Framework of Desimone. *Creative Education, 04*, 11-18.
- Kelly-Irving, M. & Delpierre, C. (2019). A Critique of the Adverse Childhood Experiences Framework in Epidemiology and Public Health: Uses and Misuses. *Social policy and society, 18*, 3, 445–456. <https://doi.org/10.1017/S1474746419000101>
- Kramer, R. (1976). *Maria Montessori: A biography*. Addison-Wesley.
- Lang, J. M., Campbell, K., & Vanerploeg, J.J. (2015, Sept.) Advancing trauma informed systems for children. *Impact*. Child health and development Institute of Connecticut.
- Lacey, R. E., & Minnis, H. (2020). Practitioner Review: Twenty years of research with adverse childhood experience scores - Advantages, disadvantages and applications to practice. *Journal of child psychology and psychiatry, and allied disciplines, 61*(2), 116–130. <https://doi.org/10.1111/jcpp.13135>
- Levine, P. (1997). *Waking the Tiger: Healing trauma*. North Atlantic Books
- Levine, P. & Kline, M. (2007/2019) *Trauma through a child's eyes*. North Atlantic Books.
- Levine, P. (2010). *In an Unspoken Voice: how the body releases trauma and restores goodness*. North Atlantic Books.
- Lillard, A. (2005). *Montessori: The Science Behind the Genius*. Oxford University Press.

- Lillard, A. (2011). Mindfulness practices in education: Montessori's approach. *Mindfulness*, 2, 78–85. <https://doi.org/10.1007/s12671-011-0045-6>
- Lillard, A. S. & Else-Quest, N. (2006). Evaluating Montessori education. *Science* 313, (5795), 1893-1894 <https://doi.org/10.1126/science.1132362>
- Lillard, A. S., Meyer, M. J., Vasc, D., & Fukuda, E. (2021). An Association Between Montessori Education in Childhood and Adult Wellbeing. *Frontiers in psychology*, 12, 721943. <https://doi.org/10.3389/fpsyg.2021.721943>
- Lillard, A. S., Taggart, J., Yonas, D., & Seale, M. N. (2021, in press). An alternative to “no excuses”: Considering Montessori as culturally responsive pedagogy. *Journal of Negro Education*.
- Ludy-Dobson, C., & Perry, B., D. (2010). The Role of Healthy Relational Interactions in Buffering the Impact of Childhood Trauma. In E. Gil (Ed.) *Working with Children to Heal Interpersonal Trauma: The Power of Play*. The Guilford Press.
- MacKinnon, L. (2012). The Neurosequential Model of Therapeutics: An Interview with Bruce Perry. *The Australian and New Zealand Journal of Family Therapy* 33(3), 210-218. <https://doi.org/10.1017/aft.2012.26>
- Mc Sherry, D. (2021). A New Vision for the Journal of Child and Adolescent Trauma. *Journal of Child and Adolescent Trauma*. 14:1-3 <https://doi.org/10.1007/s40653-021-00347-z>
- Marguiles, A. R. (1913). Dr. Montessori and her Method. *American Annals of the Deaf*, 58(5), 496–502. <https://www.jstor.org/stable/44464755>
- Maté, G. (2019). *When the body says no: The cost of hidden stress*. Vermilion.
- Mate, G. (2021). Trauma is not what happens to you, it's what happens inside you. <https://www.youtube.com/watch?v=nmJOuTAK09g>

- Matjasko, J. L., Herbst, J. H., & Estefan, L. F. (2022). Preventing Adverse Childhood Experiences: The Role of Etiological, Evaluation, and Implementation Research. *American journal of preventive medicine*, 62(6 Suppl 1), S6–S15. <https://doi.org/10.1016/j.amepre.2021.10.024>
- Mayfield, M. (2006). Maria Montessori: Advocate for children. *AMI Communications* 2. 4–9.
- Maynard, B. R., Farina, A., Dell, N. A., & Kelly, M. S. (2019). Effects of trauma-informed approaches in schools: A systematic review. *Campbell Systematic Reviews*, 15(1-2), Article e1018. <https://doi.org/10.1002/cl2.1018>
- McEwen, C. A., & Gregerson, S. F. (2019). A Critical Assessment of the Adverse Childhood Experiences Study at 20 Years. *American journal of preventive medicine*, 56(6), 790–794. <https://doi.org/10.1016/j.amepre.2018.10.016>
- Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. Jossey Bass.
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative Research: A Guide to Design and Implementation* (4th ed.). San Francisco, CA: Jossey Bass.
- Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the Measurement of Adversity. *Child maltreatment*, 22(1), 58–68.
- Mesirow, J., (1991). *Transformative dimensions of adult learning*. Jossey-Bass.
- Montessori, M. (1909). *Il metodo della pedagogia scientifica applicato all'educazione infantile nelle case dei bambini*. Scipione Lapi.
- Montessori, M. (1913). *Pedagogical Anthropology*. Frederick A. Stokes Company.
- Montessori, M. (2013). The White Cross. *AMI Journal*, 1-2, 37–41. (Original work published 1917)
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. and Trans.). Longmans.

- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books.  
(Original work published 1912)
- Montessori, M. (1966). *The secret of childhood* (M. J. Costelloe, Trans). Ballantine.
- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans). Dell. (Original work published 1949)
- Montessori, M. (1971). *The Four Planes of Education*. AMI Communications.
- Montessori, M. (1975). *The Formation of Man*. (Trans. by A.M. Joosten) Kalakshetra Publications. (Original work published 1949).
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series. Montessori-Pierson.
- Montessori, M. (2012). *The 1946 London Lectures by Maria Montessori*. (Dr. Annette Haines Ed.). Montessori-Pierson.
- Moretti, E. (2014). Beyond biological ties: Sibilla Aleramo, Maria Montessori, and the construction of social motherhood. *Italian Culture*, 32(1), 32–49.  
<https://doi.org/10.1179/0161462213Z.00000000022>
- Moretti, E. (2021). *The best weapon for peace: Maria Montessori, education, and children's rights*. University of Wisconsin Press.
- Moss, J.D. & Epstein, Ann. (2023). Montessori Education and Inclusion. In A. Murray, E.-M., T. Ahlquist, M. McKenna, & M. Debs (Eds.) *The Bloomsbury handbook of Montessori education*. (2023). Bloomsbury.
- Mulholland, M., & O'Toole, C. (2021). When it matters most: A trauma-informed, outdoor learning programme to support children's wellbeing during COVID-19 and beyond. *Irish Educational Studies*, 40(2), 329–340.  
<https://doi.org/10.1080/03323315.2021.1915843>

- Murray, Angela, Eva-Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. (2023). *The Bloomsbury Handbook of Montessori Education*. Bloomsbury Publishing.
- National Child Traumatic Stress Network, Schools Committee. (2017). *Creating, supporting, and sustaining trauma-informed schools: A system framework*. Los Angeles, CA, and Durham, NC: National Centre for Child Traumatic Stress. NCCTS.
- National Child Traumatic Stress Network, (2020).
- National Council for Curriculum and Assessment, NCCA, 2009. “Aistear: The Early Childhood Curriculum Framework”.
- National Institute for the Clinical Application of Behavioural Medicine [www.nicabm.com](http://www.nicabm.com)
- National Scientific Council on the Developing Child. (2005/2014). *Excessive stress disrupts the architecture of the developing brain: working paper no. 3*. Updated 2014. <https://www.developingchild.harvard.edu>.
- National Scientific Council on the Developing Child (2010). *Early Experiences Can Alter Gene Expression and Affect Long-Term Development: Working Paper No. 10*. [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu).
- National Scientific Council on the Developing Child. (2020). *Connecting the brain to the rest of the body: Early childhood development and lifelong health are deeply intertwined, Working Paper No. 15*. <https://developingchild.harvard.edu/resources/connecting-the-brain-to-the-rest-of-the-body-early-childhood-development-and-lifelong-health-are-deeply-intertwined/>
- National Research Council (US) and Institute of Medicine (US) Committee on Integrating the Science of Early Childhood Development, Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From Neurons to Neighborhoods: The science of early childhood development*. Washington, D.C.: National Academies Press (US).



- Nicholson, J., Perez, L., Kurtz, J., Bryant, S., & Giles, D. (2023). *Trauma-Informed Practices for Early Childhood Educators: Relationship-Based Approaches that Reduce Stress, Build Resilience and Support Healing in Young Children*. Routledge.
- Neurosequential Network, [www.neurosequential.com](http://www.neurosequential.com)
- O'Donnell, M., & Palinkas, L. (2024). Taking a trauma and adversity perspective to climate change mental health. *European journal of psychotraumatology*, 15(1), 2343509. <https://doi.org/10.1080/20008066.2024.2343509>
- O' Leary, Z. (2017). *The Essential Guide To Doing Your Research Project*. SAGE
- Opfer, D and Pedder, D., 2011. Conceptualizing Teacher Professional Learning. *Review of educational research*, 81: 376.
- O'Toole, C., & Dobutowitsch, M. (2023). The Courage to Care: Teacher Compassion Predicts More Positive Attitudes Toward Trauma-Informed Practice. *Journal of Child and Adolescent Trauma*. 16:123-133. <https://doi.org/10.1007/s40653-022-00486-x>
- O'Toole, C. (2022). Childhood adversity and education: Integrating trauma-informed practice within school wellbeing and health promotion frameworks. In *Wellbeing and Schooling: Cross Cultural and Cross Disciplinary Perspectives*. UK: Springer.
- Overstreet, S., & Chafouleas, S. M. (2016). Trauma-informed schools: Introduction to the special issue. *School Mental Health*, 8, 1–6. <https://doi.org/10.1007/s12310-016-9184-1>
- Pansiri, J. (2005). Pragmatism: and methodological approach to research in strategic alliances in tourism. *Tourism and Hospitality Planning & Development*, 2(3), 191-206. <https://doi.org/10.1080/14790530500399333>
- PEIN (2019). Adverse Childhood Experiences (ACEs): Holding that child's hand in prevention and early intervention for children and families. (Policy Paper) <https://www.pein.ie/wp-content/uploads/2019/10>

- Peirce, C., S. (1878). How to Make Our Ideas Clear. *Popular Science Monthly*. January. 286-302.
- Perry, B. D. (1999). Memories of Fear: How the Brain Stores and Retrieves Traumatic Experience. In J. M. Goodwin and R. Attias (eds.), *Splintered Reflections: Images of the body in Trauma*. Basic Books.
- Perry, B. D. (2001). The neuroarcheology of childhood maltreatment: the neurodevelopmental costs of adverse childhood events. In: *The cost of maltreatment: Who pays? We all do*. (Eds., K. Franey, R. Geffner & R. Falconer), Family violence and sexual assault Institute, San Diego, pp. 15 to 37.
- Perry, B. D. (2003). Effects of traumatic events on children: An Introduction. Child Trauma Academy. [https://childtrauma.org/wp-content/uploads/2013/11/PTSD\\_Caregivers.pdf](https://childtrauma.org/wp-content/uploads/2013/11/PTSD_Caregivers.pdf)
- Perry, B. D. (2006). The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children. In N.B. Webb (Ed.) *Working with traumatized youth in child welfare* (pp. 27 – 52). The Guilford Press.
- Perry, B. D. (2007). Stress, trauma and post-traumatic stress disorders in children: An introduction. Child Trauma Academy. [https://childtrauma.org/wp-content/uploads/2013/11/PTSD\\_Caregivers.pdf](https://childtrauma.org/wp-content/uploads/2013/11/PTSD_Caregivers.pdf)
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–245. <https://doi.org/10.1080/15325020903004350>
- Perry, B. D. (2014). The cost of caring: Understanding and preventing secondary traumatic stress when working with traumatized and maltreated children. CTA Parent and caregiver education series. Vol. 2: Issue 7. <https://www.childtrauma.org/trauma-ptsd>

- Perry, B. D., Pollard, R. A., Blakley, Y. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and use-dependent development of the brain: How states become traits. *Infant Mental Health Journal*, 16(4), 271–291. [https://doi.org/10.1002/1097-0355\(199524\)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B](https://doi.org/10.1002/1097-0355(199524)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B)
- Perry, B. D., & Pollard, R. (1998). Homeostasis, stress, trauma, and adaptation: A neurodevelopmental view of childhood trauma. *Child and Adolescent Psychiatric Clinics*, 7(1), 33-51.
- Perry, B. D., & Szalavitz, M. (2006/2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook—what traumatized children can teach us about loss, love, and healing*. Basic Books.
- Perry, B. D., & Hambrick, E. P. (2008). The Neurosequential Model of Therapeutics. *Reclaiming Children and Youth*. Vol 17 (3).
- Perry, B.D., Graner, S. (2018). *The Neurosequential Model in Education: Introduction to the NME Series: Trainer's Guide (NME Training Guide)*. Child Trauma Academy Press.
- Perry, B.D., Ablon, J.S. (2019). CPS as a Neurodevelopmentally Sensitive and Trauma-Informed Approach. In: Pollastri, A., Ablon, J., Hone, M. (eds) Collaborative Problem Solving. Current Clinical Psychiatry. Springer, Cham. [https://doi.org/10.1007/978-3-030-12630-8\\_2](https://doi.org/10.1007/978-3-030-12630-8_2)
- Perry, B. D., & Winfrey, O. (2021). *What happened to you? Conversations on trauma, resilience, and healing*. Pan Macmillan.
- Phillips, S., & Phillips, B. (2016). *Healing early childhood trauma: The Montessori way*. CreateSpace Independent Publishing.

- Phillips, B., O'Toole, C., McGilloway, S., & Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. *Journal of Montessori Research*. 8 (1): pp.13-28. <https://doi.org/10.17161/jomr.v8i1.15767>
- Phillips, B. (2022). The Montessori Method, and the Neurosequential Model in Education (NME). A comparative study. *Journal of Montessori Research* 8(2): pp.33-43. <https://doi.org/10.17161/jomr.v8i2.18419>.
- Pino, N. A., Piatanesi, A., Valensisi, G., Boschi, E. (2008). The 28 December 1908, Messina Straits earthquake ( $M_w$  7.1): A great earthquake through a century of seismology. *Istituto Nazionale di Geofisica e Vulcanologia*.  
<https://pubs.geoscienceworld.org/ssa/srl/article-abstract/80/2/243/143519/The-28-December-1908-Messina-Straits-Earthquake-MW>
- Porges, S. (2004). Neuroception: a subconscious system for detecting threats and safety. *Zero to Three: Bulletin of the National Centre for Clinical Infant Programs* (J), v24 n5 p. 19-24.
- Povell, P. (2010). *Montessori comes to America: The leadership of Maria Montessori and Nancy McCormick Rambusch*. University Press of America.
- Powell, T. C. (2001). Competitive advantage: logical and philosophical considerations, *Strategic Management Journal*, 22(9), 875-888.
- Preschlack, P. (2023). *The Montessori Potential: How to foster independence, respect, and joy in every child*. Chicago Review Press.
- Psychological Society of Ireland (PSI). (<https://www.psychologicalsociety.ie/footer.PSI-Code-of-Professional-Ethics-3>).
- Radice, S. (1920). *The new children: Talks with Dr. Maria Montessori*. Frederick A. Stokes Company.

Randolph, J. J., Bryson, A., Menon, L., Henderson, D. K., Kureethara

Manuel, A., Michaels, S., Rosenstein, D. L. W., McPherson, W., O'Grady, R.,  
& Lillard, A. S. (2023). Montessori education's impact on academic and  
nonacademic outcomes: A systematic review. *Campbell Systematic Reviews*, 19,  
e1330. <https://doi.org/10.1002/cl2.1330>

Rathunde, K. (2023). Montessori education, optimal experience, and flow. In Chapter 27, pp.  
271-289. In Murray, A. K.; Ahlquist, E. T. McKenna; Debs, M. C. (eds.) *The  
Bloomsbury Handbook of Montessori Education*. (2023). Bloomsbury.

Rathunde, K. Creating a context for flow: The importance of personal insight and experience.  
(2015). *The NAMTA Journal*. 40 (3).

Rathunde, K., & Csikszentmihalyi, M. (2005). Middle School Students' Motivation and Quality of  
Experience: A Comparison of Montessori and Traditional School Environments. *American  
Journal of Education*, 111(3), 341–371. <https://doi.org/10.1086/428885>

Scocchera, A. (2013). Montessori, the White Cross, and Prof. Ferrari. *AMI Journal*, 1-2, 48–  
50. (Original work published 2002)

Schore, A. (2003). Early Relational Trauma, disorganised attachment, and the development of  
a predisposition to violence. In M. F. Solomon & D. J. Siegel (Eds.), *Healing trauma:  
Attachment, mind, body and brain* (pp107-167). New York, NY: Norton.

Schore, A. (2008). Modern Attachment Theory: The Central Role of Affect Regulation in  
Development and Treatment. *Clinical Social Work Journal*: 36:9-20.

Seguin, E. (1866). *Idiocy and its Treatment by the Physiological Method*. William Wood &  
Co.

Sholt, M. & Gavron, T. (2006). Therapeutic Qualities of Clay-work in Art Therapy and  
Psychotherapy: A Review, *Art Therapy*, 23:2, 66-  
72, DOI: [10.1080/07421656.2006.10129647](https://doi.org/10.1080/07421656.2006.10129647)

- Shonkoff, J. P., & Phillips, D. A. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, D.C.: National Academy Press.
- Shonkoff, J. P., & Garner, A. S. (2012). Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, & Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, *129*(1), e232–e246. <https://doi.org/10.1542/peds.2011-2663>
- Siegel, D. (2020). *The Developing Mind: How relationships and the brain interact to shape who we are*. Guilford Press.
- Slade, E. (2021). *Montessori in Action: Building Resilient Montessori Schools*. Jossey-Bass.
- Sobe, N. W. (2004). "Challenging the Gaze: The Subject of Attention and a 1915 Montessori Demonstration Classroom. *Educational Theory*. Vol. 15 (1) p. 166 - 189 <https://doi.org/10.1111/j.0013-2004.2004.00020.x>
- Sorrels, B. (2015). *Reaching and teaching children exposed to trauma*. Gryphon House.
- Stake R. E. (2005). Qualitative case studies. In Denzin N. K., Lincoln Y. S. (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443-466). Thousand Oaks, CA: Sage.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stenhouse, L. (1988). Case study methods. In John. P. Keeves (ed.) *Educational Research, Methodology, and Measurement: an International Handbook*, 1<sup>st</sup> edn. Oxford: Pergamon Press, Sidney, 49-53.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, *40*, 77–82.
- Streck-Fisher, A. and van der Kolk, B. (2000). Down will come baby, cradle and all: Diagnostic and therapeutic implications of chronic trauma on child development.

*Australian & New Zealand Journal of Psychiatry*, Vol 34(6):903-918.

<https://doi.org/10.1080/000486700265>

Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. SAMHSA's Trauma and Justice Strategic Initiative.

[https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf)

Taylor, S. S. (2021). Trauma-informed care in schools: A necessity in the time of COVID-19. *Beyond Behavior* 30(3), 124-134. <https://doi.org/10.1177/10742956211020841>

The White Cross: Care of child victims of the war. (1917, September 24). *The Times of London*.

The White Cross: Dr. Montessori's scheme for healing the wounded minds of child war victims. (1916, September 18). *London Daily News*.

Thomas, G. (2021). *How to do your Case Study*. SAGE

Thomas, G. (2017). *How to do your research project: A guide for students*. SAGE

ThinkTVPBS. (2020a, August 25). Stress, trauma, and the brain: Insights for educators-the neurosequential model [video]. You Tube. [https://www.youtube.com/watch?v=3is3xHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=3is3xHKKs&ab_channel=ThinkTVPBS)

ThinkTVPBS. (2020b, August 25). Stress, trauma, and the brain: Insights for educators-how stress impacts brain function [video]. You Tube. [https://www.youtube.com/watch?v=3is3xHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=3is3xHKKs&ab_channel=ThinkTVPBS)

ThinkTVPBS. (2020c, August 25). Stress, trauma, and the brain: Insights for educators-the power of connection [video]. You Tube. [https://www.youtube.com/watch?v=3is3xHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=3is3xHKKs&ab_channel=ThinkTVPBS)

ThinkTVPBS. (2020d, August 25). Stress, trauma, and the brain: Insights for educators-regulating yourself and your classroom [video]. You Tube.

[https://www.youtube.com/watch?v=3is3xHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=3is3xHKKs&ab_channel=ThinkTVPBS)

- ThinkTVPBS. (2020e, August 25). Stress, trauma, and the brain: Insights for educators-educator strategies for the classroom [video]. You Tube.
- Thomas, M. S., Crosby, S., & Vanderhaar, J. (2019). Trauma-informed practices in schools across two decades: An interdisciplinary review of research. *Review of Research in Education, 43*(1), 422–452. <https://doi.org/10.3102/0091732X18821123>
- Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori. *McClure's Magazine, 37*(1), 3–19.
- Trabalzini, P. (2013). Nobody left behind: Montessori's work in defense of children as victims of war. *AMI Journal, 1-2*, 42–45.
- Trabalzini, P. (2011). Maria Montessori through the seasons of the “Method.” *The NAMTA Journal, 36*(2).
- Treisman, K. (2021). *A treasure box for creating trauma-informed organisations: A ready to use resource for trauma, adversity, and culturally informed, infused and responsive systems*. Jessica Kingsley.
- Treisman, K. (2017). *Working with relational and developmental trauma in children and adolescents*. Routledge.
- Trovato, B., Godos, J., Varrasi, S., Roggio, F., Castellano, S., & Musumeci, G. (2023). Physical Activity, Sun Exposure, Vitamin D Intake and Perceived Stress in Italian Adults. *Nutrients, 15*(10), 2301. <https://doi.org/10.3390/nu15102301>
- United Nations Convention on the Rights of the Child. UNCRC. 1989.
- van der Kolk, B. A. (1998). Psychology and psychobiology of childhood trauma. *Praxis der Kinderpsychologie und Kinderpsychiatrie 47*(1), 19
- van der Kolk, B. A. (2003). The neurobiology of childhood trauma and abuse. *Child and adolescent psychiatric clinics of North America, 12*(2), 293–ix. [https://doi.org/10.1016/s1056-4993\(03\)00003-8](https://doi.org/10.1016/s1056-4993(03)00003-8)



- van der Kolk, B. (2014). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Penguin.
- VanZomeren-Dohm, A., Ng, R., Howard, K., Kenney, M., Ritchmeier, L. & Gourneau (2013). Children's mental health review: How trauma gets under the skin. University of Minnesota Extension.
- Venet, A. S. (2021). *Equity-centered, trauma-informed education*. Norton & Co. Inc.
- Wafford, M. & Debs, M. (2023). Countering Myths in Montessori Education. In *Equity Examined: How to design schools and teacher education programs where everyone thrives*. American Montessori Society (AMS). (amshq.org).
- White, J. (1914). *Montessori schools: As seen in the early summer of 1913*. H. Milford.
- Williams, T., & Stephens, K. (2023). pps. 309-314. In Murray, A. K.; Ahlquist, E. T. McKenna; Debs, M. C. (eds.). *The Bloomsbury Handbook of Montessori Education*. (2023). Bloomsbury.
- Wilson, T. K., Riley, A., Khetarpal, S. K., Abernathy, P., Booth, J., & Culyba, A. J. (2023). Exploring the Impact of Racism on Black Youth: A Multidimensional Examination of Discriminatory Experiences Across Place and Time. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 72(2), 246–253.
- Wolpow, R., Johnson, M. M., Hertel, R., & Kincaid, S. O. (2009/2016). *The heart of learning and teaching: Compassion, resiliency, and academic success*.  
<https://www.k12.wa.us/sites/default/files/public/compassionateschools/pubdocs/theheartoflearningandteaching.pdf>
- World Health Organisation (2020). Adverse Childhood Experiences International Questionnaire. (ACE-IQ).

- World Health Organization. (2018). Adverse Childhood Experiences International Questionnaire. In Adverse Childhood Experiences International Questionnaire (ACE-IQ). [website]: Geneva: WHO.
- Wright, T. (2019). Growing Hope: Developing supportive Montessori classrooms for traumatized children. *Montessori Collaborative World Review*. Vol 1 (1).
- Wright, T. (2023). Emotionally Responsive Teaching: Expanding trauma informed practice with young children. Teachers College Press.

## Appendix A

**Table 1**

(Category 1. Authors).

References in alphabetical order.

- Bailey, C. S. (1915). *Montessori children*. Holt
- Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian refugees. *AMI Communications*, 2, 11–13. (Original work published 1916)
- Fisher, D. C. (1912). *A Montessori Mother*. Henry Holt & Company.
- George, A. E. (1912, July). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping*, 55(1), 24–29.
- Marguiles, A. R. (1913). Dr. Montessori and her Method. *American Annals of the Deaf*, 58(5), 496–502. <https://www.jstor.org/stable/44464755>
- Stevens, E. Y. (1912). *The Montessori Method and the American kindergarten*. *McClure's Magazine*, 40, 77–82.
- White, J. (1914). *Montessori schools: As seen in the early summer of 1913*. H. Milford.

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(Category 2. Author).

Reference

- Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori. *McClure's Magazine*, 37(1), 3–19.

---

(Category 3. Author).

References

- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books. (Original work published 1912)
- Montessori, M. (1966). *The secret of childhood* (M. J. Costelloe, Trans). Ballantine.
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series. Montessori-Pierson
- Montessori, M. (2013). The White Cross. *AMI Journal*, 1-2, 37–41. (Original work published 1917)
-

## Appendix B



### SRESC TEMPLATE

## INFORMATION AND CONSENT FORM FOR RESEARCH PARTICIPANTS

### Information Sheet for STUDY

**Purpose of the Study.** I am Bernadette Phillips, a doctoral student, in the Department of Education, Maynooth University.

As part of the requirements for my PhD degree, I am undertaking a research study under the supervision of Dr.Catriona O'Toole and Professor Sinead McGilloway. This research is funded by the Irish Research Council (IRC).

The study is concerned with offering a training programme, designed by the researcher, to creche/Montessori staff, on the subject of trauma-informed practice. Participants will learn what trauma is and how it impacts the young child's brain development, states of arousal and behaviour. They will learn how to interpret the challenging behaviours they observe and how to use simple strategies to calm and reduce anxiety in these children. They will learn about the link between trauma-informed practice and the original Montessori schools which were known as 'healing' environments.

#### What will the study involve?

Participants in receipt of CPD training (Experimental Group), Study 1 will involve:

- Attendance at a Continuing Professional Development (CPD) programme, designed by the researcher. The Introductory session will be held on a Saturday. The programme consists of five half day sessions, which will be held in your creche every second Saturday from 8.30am until 1.30pm

with two 15 minute breaks. The CPD training course will cover such areas as: The impact of trauma on children's cognitive, social and emotional functioning. The impact of trauma on children's states of arousal and behaviour. How to interpret challenging behaviours in trauma- impacted children. What strategies to use to calm trauma-impacted children. The sessions will consist of lectures, discussions and questions and answers. Participants will receive printed handouts summarizing the material covered in each session. There will be no assignments or homework requirements. Participants are merely asked to attend the sessions.

- Completion of a small number of questionnaires at two time points – before the CPD training and after the CPD training sessions. The questionnaires will assess aspects of your professional wellbeing and your perspectives on trauma-informed practice, for example, one of the questionnaires explores different attitudes or perspectives you may have in relation to your work, including how stressful your work is for you and the extent to which you tend to be compassionate towards yourself. If you do not wish to complete a particular item on the questionnaires you can leave it blank. The questionnaires should take no more than 20 minutes to complete.
- You may also be invited to attend an interview with the researcher to give more in-depth feedback on your opinions of and attitudes towards the impact, feasibility and experience of the CPD programme. The interview may be face to face, by phone or on-line. It will be between 30 and 60 minutes in duration.

**Who has approved this study?** This study has been reviewed and received ethical approval from Maynooth University Research Ethics committee and. You may have a copy of this approval if you request it.

**Why have you been asked to take part?** You have been asked to take part in Study 1 because you work in a creche and have regular direct contact with the children in the creche.

**Do you have to take part?**

No, you are under no obligation whatsoever to take part in this research. However, we hope that you will agree to take part and give us some of your time. There are potential benefits for participants and the children in their care to be derived from participation in this research. These include the learning of:

(a) Strategies to support teachers:

The participants will learn how to recognise and understand their own triggers around children's behaviours and will learn how to support themselves so that they can become self-aware, reflective, and able to engage in self-care.

(b) Strategies to support children:

The participants will learn how to develop supportive relationships with children who may have experienced trauma and how to create nurturing environments for them to promote resilience and healing.

It is entirely up to you to decide whether or not you would like to take part. If you decide to do so, you will be asked to sign a consent form and given a copy and the information sheet for your own records. If you decide to take part, you are still free to withdraw at any time without giving a reason and/or to withdraw your information up until such time as the research findings are published and/or the thesis is submitted in 2024. A decision to withdraw at any time, or a decision not to take part, will not affect your relationships with your creche/Montessori school.

### **What information will be collected?**

The questionnaire will explore the various attitudes you may have in relation to trauma-informed practice. It will also explore different attitudes or perspectives you may have in relation to your work with children, including how stressful your work is for you and the extent to which you tend to be compassionate towards yourself. If you do not want to complete a particular item on the questionnaire you can leave it blank.

The interview will look for more in-depth feedback on your opinions of and attitudes towards the impact, feasibility and experience of the CPD programme.

**Will your participation in the study be kept confidential?** Yes, all information that is collected about you during the course of the research will be kept confidential. No names will be identified at any time. All hard copy information will be held in a locked cabinet at the researchers' place of work, electronic information will be encrypted and held securely on MU PC or servers and will be accessed only by Bernadette Phillips, Dr. Catriona O'Toole and Professor Sinead McGilloway.

No information will be distributed to any other unauthorised individual or third party. If you so wish, the data that you provide can also be made available to you at your own discretion.

*'It must be recognised that, in some circumstances, confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances the University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.'*

**What will happen to the information which you give?** All the information you provide will be kept at Maynooth University in such a way that it will not be possible to identify you. All findings will be anonymized. On completion of the research, the data will be retained on the MU server. After ten years, all data will be destroyed (by the PI). Manual data will be shredded confidentially and electronic data will be reformatted or overwritten by the PI in Maynooth University.

**What will happen to the results?** The research will be written up and presented as a summary report, an article in scientific journals, a presentation at conferences, and/or a thesis. A copy of the research findings will be made available to you upon request. (Please email: Bernadette.phillips.2021@mumail.ie).

**What are the possible disadvantages of taking part?** I don't envisage any negative consequences for you in taking part, but I am aware that the training programme will refer to 'sensitive' issues such as abuse, poverty, neglect, and trauma. These issues will be discussed in a sensitive and careful manner. The researcher is acutely aware that the safety and wellbeing of the participants is of paramount importance and the researcher will keep this at the forefront of her mind at all times. It is possible that a participant who has experienced any of these adversities could feel some distress, therefore Intending participants should carefully consider this before agreeing to participate.

**What if there is a problem?** If you experience any distress following the programme or interview you may contact AWARE (01 6766166) or the Samaritans (116 123). You may contact my *supervisor*, *Dr. Catriona O'Toole*, if you feel the research has not been carried out as described above.

**Any further queries?** If you need any further information, you can contact me: Bernadette Phillips , mobile numbers 0851907588 or 07851541815 my email address is [bernadette.phillips.2021@mumail.ie](mailto:bernadette.phillips.2021@mumail.ie)

If you agree to take part in the study, please complete and sign the consent form overleaf.

**Thank you for taking the time to read this.**

## Consent Form [*Amend appropriately for your study*]

I.....agree to participate in [*researchers name*]'s research study titled [*title*].

Please tick each statement below [*please delete or amend the statements as appropriate*]:

The purpose and nature of the study has been explained to me verbally & in writing. I've been able to ask questions, which were answered satisfactorily.

I am participating voluntarily.

I give permission for my [*insert as appropriate e.g. interview*] with [*name*] to be [*insert as appropriate audio/video-recorded*]

I understand that I can withdraw from the study, without repercussions, at any time, whether that is before it starts or while I am participating.

I understand that I can withdraw permission to use the data right up to [*insert as appropriate publication/anonymisation/submission of thesis*] [*Date*].

It has been explained to me how my data will be managed and that I may access it on request.

I understand the limits of confidentiality as described in the information sheet

I understand that my data, in an anonymous format, may be used in further research projects and any subsequent publications if I give permission below:

[*Select as appropriate*]

I agree to quotation/publication of extracts from my interview

I do not agree to quotation/publication of extracts from my interview

I agree for my data to be used for further research projects

I do not agree for my data to be used for further research projects

I agree for my data, once anonymised, to be retained indefinitely in the IQDA archive

Signed.....

Date.....

Participant Name in block capitals .....



---

*I the undersigned have taken the time to fully explain to the above participant the nature and purpose of this study in a manner that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.*

Signed.....

Date.....

Researcher Name in block capitals .....

*If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at [research.ethics@mu.ie](mailto:research.ethics@mu.ie) or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.*

*For your information the Data Controller for this research project is Maynooth University, Maynooth, Co. Kildare. Maynooth University Data Protection officer is Ann McKeon in Humanity house, room 17, who can be contacted at [ann.mckeon@mu.ie](mailto:ann.mckeon@mu.ie). Maynooth University Data Privacy policies can be found at <https://www.maynoothuniversity.ie/data-protection>.*

***Two copies to be made: 1 for participant, 1 for PI***

## Appendix C

### KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1(a)

#### Your prior knowledge about the ACE Study.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Prior to attending this CPD course I knew a lot about the ACE Study”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“Prior to attending this CPD course, I knew a little bit about the ACE Study”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“Prior to attending this CPD course, I knew nothing about the ACE Study”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1 (b)

The knowledge you gained about the ACE Study from attendance at this CPD course.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Following attendance at this CPD course, I learned that ACEs are common in all socio-economic groups.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I learnt that ACEs are interrelated, and tend to occur in clusters, ie someone who has one ACE score because they live in a household exposed to alcoholic misuse, most likely has another ACE score because they are exposed to neglect.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I learned that ACEs are a common pathway towards negative behaviours which can lead to disease, disability, social problems, and sometimes, premature death”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1(c)

Prior knowledge about TRAUMA from your teacher training.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Prior to attending this CPD course, my level of knowledge about Trauma was minimal because I had no exposure to trauma training in my teacher education programme.”

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Prior to attending this CPD course, my level of knowledge about Trauma was at a basic level because I had a basic level of exposure to trauma training in my teacher education programme”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Prior to attending this CPD course, my level of knowledge about Trauma was at a high level because I had a significant level of exposure to trauma training in my teacher education programme”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1(d)

The knowledge you gained about TRAUMA resulting from attendance at this CPD course.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Attending this CPD course increased my KNOWLEDGE about Trauma.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course gave me interdisciplinary KNOWLEDGE from psychology, neuroscience and education about Trauma”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course increased my KNOWLEDGE about how trauma can alter a child’s world view.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course increased my KNOWLEDGE about the possible impact of trauma on the emotional, social and cognitive functioning of the children in my classroom”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1(e)

Prior knowledge about TRAUMA-INFORMED PRACTICE from your teacher training.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was minimal because I had no exposure to trauma training in my teacher education programme.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

“Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was at a basic level because I had a basic level of exposure to trauma training in my teacher education programme”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

“Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was at a high level because I had a significant level of exposure to trauma training in my teacher education programme”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1(f)

The knowledge you gained about TRAUMA-INFORMED PRACTICE from attendance at this CPD course.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Attending this CPD course increased my KNOWLEDGE about Trauma-Informed Practice (TIP).

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course gave me interdisciplinary KNOWLEDGE from psychology, neuroscience and education about Trauma-Informed Practice”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course increased my KNOWLEDGE about the possible impact of trauma on the emotional, social and cognitive functioning of the children in my classroom”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Attending this CPD course increased my KNOWLEDGE about the importance of viewing children through a trauma-informed lens”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1 (g)

Your prior knowledge of Montessori's interest and expertise in Mental Health, Childhood Trauma and Trauma-Informed Practice.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Prior to attendance at this CPD programme, I knew nothing at all about Dr Montessori and her interest and expertise in mental, childhood trauma and trauma-informed practice because I am not a Montessori teacher”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Prior to attendance at this CPD programme, I knew very little about Dr Montessori and her interest and expertise in mental health, childhood trauma, and trauma-informed practice because it was NOT covered in my teacher training”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Prior to attendance at this CPD programme, I knew a great deal about Dr Montessori and her interest and expertise in mental health, childhood trauma, and trauma-informed practice because it was covered extensively in my teacher training”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.



KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 1 (h)

The knowledge you gained on Montessori’s interest and expertise in Mental Health, Trauma and Trauma-Informed Practice resulting from attendance at this CPD course.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Following attendance at this CPD course, I have learnt a great deal about Dr Montessori and her interest and expertise in mental health and childhood trauma”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD course, I have gained an understanding of how Dr Montessori used her materials and activities as ‘tools’ of healing”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD course, I have gained an understanding of how Dr Montessori trained her teachers to be a ‘source’ of healing”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD course, I have gained an understanding of how Dr Montessori created environments that were “places” of healing”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD course, I have gained an understanding of how the Montessori Method shares many commonalities with current discoveries in neuroscience”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 2 (a)

Your **Attitudes/Opinions** related to Trauma-Informed Approaches.

Please tick one of the answers below which most closely matches your opinion.

“I think children’s “difficult” behaviours may be caused by what happened to them”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“I think children’s “difficult” behaviours are usually caused by their own inherent character flaws such as stubbornness/selfishness/badness”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“I think that when children are emotionally dysregulated (ie not able to control their emotions) it is helpful to apply the model, Regulate, Relate, Reason (Perry) in that order”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“I think that when children are emotionally dysregulated (ie not able to control their emotions) we need to apply strict discipline which may involve punishments”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“I think that developing positive relationships with trauma-affected children experienced is vital”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“I think that trying to develop positive relationships with trauma-affected children is a waste of time”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“I think that finding a child’s strengths and building on them could be a very effective way of helping a child to recover from traumatic experiences”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“I think that It is a waste of time to look for a child’s strengths, the child needs to just do what the others are doing and get on with life”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“I think that a trauma-informed approach has the capacity to empower a trauma affected child whose experiences have left them feeling dis-empowered”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“I think that children don’t need to feel empowered, only adults do”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“I think that a “whole school” approach is vital when the school wants to implement trauma informed practice”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“I think that teachers are individuals, some may support TIP and some may not, the school can still be “trauma-informed” and “trauma responsive” even if some staff don’t support it”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 2(b)

Your **attitudes towards** the Montessori Method as a Trauma Responsive approach.

Please tick one of the statements below which most closely matches your opinion.

“Following attendance at this CPD course, I think that the historical evidence strongly suggests that the original Montessori Method was trauma responsive.”

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I think that blending original Montessori practices with contemporary recommendations for trauma-informed practice would be beneficial”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I think that Dr Perry’s “Regulate, Relate, and the Reason” model blends well with Montessori practices.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I think that Montessori-influenced, trauma-informed practice would be very helpful to most Montessori and early childhood teachers”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this CPD course, I think that all teachers should be offered a module in trauma-informed practice as part of their training”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 3 (a)

Your **beliefs** about children’s behaviours prior to attendance at this programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Prior to attendance at this CPD programme I believed that children with “difficult” behaviours (excluding sick children) were probably just being stubborn or perhaps selfishness”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Prior to attendance at this CPD programme I believed that children with “difficult” behaviours (excluding sick children) were “choosing” to behave badly and that they could have behaved better if they tried”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

KNOWLEDGE, ATTITUDES, and BELIEFS QUESTIONNAIRE 3(b)

Your **beliefs** about children’s behaviours following attendance at this programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Following attendance at this programme, I believe that children with “difficult” behaviours (excluding sick children) may well be affected by something that happened to them which has caused them to become hyper-aroused (aggressive, unruly) or hypo-aroused (ie withdrawn, unnaturally quiet).

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

“Following attendance at this programme, I believe that children with “difficult” behaviours (excluding sick children) may not be deliberately “choosing” to behave badly but rather may have no conscious choice over their behaviours if they are in an alarm state.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

PROFESSIONAL PRACTICE QUESTIONNAIRE 4 (a)

The Impact of the CPD programme on your Professional Practice.

Please tick one of the answers below which most closely matches your opinion.

Statements:

Prior to attendance at this CPD programme I would have been more inclined to ask, “What’s wrong with this child?” rather than “What happened to this child?”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Prior to attendance at this CPD programme I would not have viewed children through a trauma-informed lens”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Prior to attendance at this CPD programme I would not have known about Dr. Perry’s advice that we need to ‘regulate, relate, and then reason’ with a child who has been affected by trauma, so I would not have done this”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Prior to attendance at this CPD programme I was not aware that Montessori activities could calm and regulate children, so I did not use them for regulation in my daily professional practice”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
Prior to attendance at this CPD programme I was not aware of how neuroscience backs up Dr. Montessori’s use of Practical life activities and other Montessori repetitive, rhythmic activities to calm and regulate children.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

PROFESSIONAL PRACTICE QUESTIONNAIRE 4 (b)

The Impact of the CPD on your Professional Practice.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Following attendance at this CPD programme, I am more inclined to ask myself “What happened to this child?” rather than “What’s wrong with this child?”

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD programme, I now view children through a trauma-informed lens”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD programme, I now try to follow Dr. Perry’s ‘regulate, relate, and then reason’ model with trauma-affected children”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD programme, I have changed some of my previous practices”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....  
“Following attendance at this CPD programme, I have started to increase my usage of Montessori activities to calm and regulate children”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.



PROGRAMME EXPERIENCE QUESTIONNAIRE 5 (a)

What are the Obstacles or Supports to the implementation of this CPD programme?.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“I think the current Government Guidelines on “Self- Regulation for Pupils”, which relies on Dr Perrys “Regulate, Relate and then Reason” model, will now make it easy to implement this CPD course in Montessori pre-school settings” because Montessori’s Method and Dr Perry’s model share many similarities, and the Dept. of Education is promoting Dr Perry’s model.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

“I think it will Not be difficult to put this Montessori-attuned, trauma-informed approach into practice in settings”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

“I think the current government pre-school policies, especially with the emphasis on a play-based curriculum, will make it difficult to implement this CPD course in settings”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

“I think it will be very difficult to put this Montessori-attuned, trauma informed approach into practice in settings”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 5 (b)

Contemporary Montessori schools versus the 'early' Montessori schools.

Please tick one of the answers below which most closely matches your opinion.

Statements: (note, 'early' means from 1907 to approx. 1920)

"I think contemporary Montessori schools are different to the 'early' Montessori schools because contemporary Montessori schools are obliged to blend a play-based curriculum with the Montessori system because of the demands of the national curriculum".

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
"I think many Montessori schools/creches fear that if they do not put most of their emphasis on a play-based curriculum they may lose their Government funding.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
"I think contemporary Montessori schools don't do enough of the Montessori Practical Life and Montessori Sensorial activities with children".

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
"I think contemporary Montessori schools don't do enough of the Montessori Mathematical and Language Activities with children".

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
"I think contemporary Montessori schools don't do enough of the Montessori Cultural Activities with children".

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 6

The EXPERIENCE of doing the CPD programme

Please tick one of the answers below which most closely matches your opinion.

Statements:

“I feel that attending this course has helped me to understand things in my own childhood and my own upbringing”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
“I believe that attending this course is helping me to be a better early years or Montessori professional”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
“I feel that attending this course is helping me in my non-professional life, ie in my interactions with my family and friends”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
“My experience of doing this CPD course, was a positive one, and I am glad that I attended it”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
“I would recommend this course to other early years and/or Montessori teachers”.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....  
Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 7

Your opinions on the possible BENEFITS of trauma informed practice.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Trauma informed practice has the capacity to benefit CHILDREN”

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

“Trauma informed practice has the capacity to benefit TEACHERS”

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

““Trauma informed practice has the capacity to benefit FAMILIES”

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 8

Your opinions on Self-Care.

Please tick one of the answers below which most closely matches your opinion.

Statements:

“Self-care is a necessity, as the saying goes - ‘you can’t pour from an empty cup’”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“Self-care is a luxury, there is no need for it”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“Self-care is time-consuming therefore it is a waste of time”

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“It is true that self-care is time-consuming, but it is necessary for good mental health”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“Physical self-care such as exercise, eating healthy foods, is vital for teachers”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....  
“Emotional self-care, such as spending time with friends and family, doing things you enjoy such as going to a dance class, watching a movie, relaxing at the spa, or lounging on the couch, is vital for teachers”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

PROGRAMME EXPERIENCE QUESTIONNAIRE 9 (a)

The CONTENT FOCUS of the CPD programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

- “Overall, the content of the sessions focused on the intended subject matter as outlined in the learning objectives”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

- “The content of Session 1 focused on “Montessori’s early ‘healing’ schools” as outlined in the learning objectives”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

- “The content of Session 2 focused on “Trauma” as outlined in the learning objectives”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

- “The content of Session 3 focused on “Trauma-informed practice” as outlined in the learning objectives”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

- “The content of Session 4 focused on “Contemporary Montessori schools and Trauma-informed practice” (TIP) as outlined in the learning objectives”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
----------------	-------	---------	----------	-------------------

.....

PROGRAMME EXPERIENCE QUESTIONNAIRE 9 (b)

The COHERENCE of the CPD programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

- “I think the CPD programme was coherent (logical and consistent).

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

- “I think the CPD programme was well-designed, clear and easy to follow”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

- “I think the CPD sessions flowed from one session to the next, resulting in a unified whole”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

- “I think the CPD programme is *consistent* with the Dept. of Education’s policy/advice on how to help stressed and trauma-affected children to become regulated by using Dr Bruce Perry’s model - Regulate/Relate/Reason”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 9 (c)

COLLECTIVE PARTICIPATION in the CPD programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

- “I think it was beneficial that teachers from the same school/creche attended the CPD programme together.”

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

- “Teachers were given opportunities to discuss/reflect together on issues arising from the course material.”

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

- “I found that opportunities to discuss/reflect on topics related to the course material were useful and/or valuable.

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

- “I think doing CPD with other staff members of your school/creche is more beneficial than doing CPD alone because you can share ideas relating to your particular setting.”

Strongly Agree                  Agree                  Neutral                  Disagree                  Strongly disagree

.....

Comments: Please add any comments you consider might be useful.



PROGRAMME EXPERIENCE QUESTIONNAIRE 9 (d)

**ACTIVE LEARNING in the CPD programme.**

Please tick one of the answers below which most closely matches your opinion.

Statements:

“The active learning (for example, observing video clips of experts (such Dr Vincent Felitti discussing the origins of the ACE Study, followed by a clip of Dr Nadine Burke Harris discussing her application of the ACE Study in her clinical work) followed by group discussion was beneficial”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

- “The demonstration and discussion of ‘affirmation circles’ for children was helpful and thought-provoking”.

Strongly Agree                      Agree                      Neutral                      Disagree                      Strongly disagree

.....

Comments: Please add any comments you consider might be useful.

PROGRAMME EXPERIENCE QUESTIONNAIRE 9 (e)

The DURATION of the CPD programme.

Please tick one of the answers below which most closely matches your opinion.

Statements:

- “I think the duration of the CPD programme (20 hrs - 4 five-hour sessions) was too short”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

- “I think the duration of the CPD programme (20 hrs - 4 five-hour sessions) was too long”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

- “I think the duration of the CPD programme (20 hrs - 4 five-hour sessions) was just right”.

Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
-------------------	-------	---------	----------	----------------------

.....

Comments: Please add any comments you consider might be useful.

## Appendix D

### Questionnaire Results

#### Questionnaire 1(a): The Knowledge of ACEs Questionnaire.

##### *Prior attendance 'Knowledge' about ACEs:*

Questionnaire 1(a), contained the following statements:

- (a) Prior to attending this CPD course I knew *a lot* about the ACE Study.
- (b) Prior to attending this CPD course, I knew *a little* bit about the ACE Study.
- (c) Prior to attending this CPD course, I knew *nothing* about the ACE Study

Results:

6 out of the 10 participants “strongly disagreed” with (a) above and 4 “disagreed”.  
6 out of the 10 participants “strongly disagreed” with (b) above, 1 “disagreed” and 3 “agreed”.  
4 out of the 10 participants “strongly agreed” with (c) above, 3 “agreed” and 2 “disagreed” and 1 “strongly disagreed”.

##### **The finding was:**

70% of the participants knew “**nothing**” about ACEs prior to attendance at this course.

#### Questionnaire 1(b): The Knowledge of ACEs Questionnaire.

##### *Post attendance 'Knowledge' about ACEs:*

Questionnaire 1(b), contained the following statements:

- (a) Following attendance at this CPD course, I learned that ACEs are common in all socio-economic groups.
- (b) Following attendance at this CPD course, I learnt that ACEs are interrelated, and tend to occur in clusters, ie someone who has one ACE score because they live in a household exposed to alcoholic misuse, most likely has another ACE score because they are exposed to neglect.

- (c) Following attendance at this CPD course, I learned that ACEs are a common pathway towards negative behaviours which can lead to disease, disability, social problems, and sometimes, premature death”.

Results:

- 7 out of the 10 participants “strongly agreed” with (a) above and 3 “agreed”.  
8 out of the 10 participants “strongly agreed” with (b) above and 2 “agreed”.  
8 out of the 10 participants “strongly agreed” with (c) above and 1 “agreed”  
and 1 “strongly disagreed”

**The finding was: by attending the course**

100% of the participants agreed that they gained knowledge about ACEs specifically that ACEs are common, interrelated and are a common pathway towards negative behaviours, which can lead to disease, disability, social problems, and sometimes, premature death, by attending this course.

**Questionnaire 1(c): The Knowledge of Trauma Questionnaire.**

***Prior attendance ‘Knowledge’ about trauma:***

Questionnaire 1(c), contained the following statements:

- (a) “Prior to attending this CPD course, my level of knowledge about Trauma was **minimal** because I had no exposure to trauma training in my teacher education programme.
- (b) “Prior to attending this CPD course, my level of knowledge about Trauma was at a **basic level** because I had a basic level of exposure to trauma training in my teacher education programme”.
- (c) “Prior to attending this CPD course, my level of knowledge about Trauma was at a **high level** because I had a significant level of exposure to trauma training in my teacher education programme”.

Results:

- 7 out of the 10 participants “strongly agreed” with (a) above and 3 “agreed”.  
7 out of the 10 participants “disagreed” with (b) above and 3 “strongly disagreed”.  
10 out of the 10 participants “strongly disagreed” with (c) above.

**The finding was:**

100% of participants had **minimal** knowledge about trauma, prior to attendance at this course because they had no exposure to trauma training in their teacher education programmes.

### **Questionnaire 1(d): The Knowledge of Trauma Questionnaire.**

#### ***Post attendance 'Knowledge' about trauma:***

Questionnaire 1(d), contained the following statements:

- (a) Attending this CPD course increased my KNOWLEDGE about Trauma.
- (b) Attending this CPD course gave me interdisciplinary KNOWLEDGE from psychology, neuroscience, and education about Trauma.
- (c) Attending this CPD course increased my KNOWLEDGE about how trauma can alter a child's world view.
- (d) Attending this CPD course increased my KNOWLEDGE about the possible impact of trauma on the emotional, social, and cognitive functioning of the children in my classroom.

Results:

- 10 out of the 10 participants "strongly agreed" with (a) above.
- 6 out of the 10 participants "strongly agreed" with (b) above and 4 "agreed".
- 10 out of the 10 participants "strongly agreed" with (c) above.
- 9 out of the 10 participants "strongly agreed" with (d) above and 1 "agreed".

#### **The finding was:**

100% of the participants gained knowledge about trauma, by attending this course, specifically, how it can alter a child's worldview, how it can impact the emotional, social, and cognitive function of children in the classroom and the participants also agreed that they gained an interdisciplinary knowledge about trauma.

### **Questionnaire 1(e): The Knowledge of Trauma-Informed Practice Questionnaire.**

#### ***Prior attendance 'Knowledge' about trauma-informed practice:***

Questionnaire 1(e), contained the following statements:

- (a) Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was **minimal** because I had no exposure to trauma training in my teacher education programme.

(b) Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was at a **basic level** because I had a basic level of exposure to trauma training in my teacher education programme”.

(c) Prior to attending this CPD course, my level of KNOWLEDGE about Trauma-Informed Practice (TIP) was at a **high level** because I had a significant level of exposure to trauma training in my teacher education programme”.

#### Results:

9 out of the 10 participants “strongly agreed” with (a) above and 1 “agreed”.

6 out of the 10 participants “disagreed” with (b) above, 2 “strongly disagreed”, 1 “agreed”, and 1 “strongly agreed”.

7 out of the 10 participants “strongly disagreed” with (c) above and 3 “disagreed”.

#### **The finding was:**

100% of participants had a **minimal** knowledge about trauma-informed practice, prior to attendance at the course because they had no exposure to trauma-informed training in their teacher education programmes.

#### **Questionnaire 1(f): The Knowledge of Trauma-Informed Practice Questionnaire.**

##### ***Post attendance ‘Knowledge ‘about trauma-informed practice:***

Questionnaire 1(f), contained the following statements:

(a) Attending this CPD course increased my KNOWLEDGE about Trauma-Informed Practice (TIP).

(b) Attending this CPD course gave me interdisciplinary KNOWLEDGE from psychology, neuroscience, and education about Trauma-Informed Practice.

(c) Attending this CPD course increased my KNOWLEDGE about the possible impact of trauma on the emotional, social, and cognitive functioning of the children in my classroom”.

(d) Attending this CPD course increased my KNOWLEDGE about the importance of viewing children through a trauma-informed lens.

#### Results:

9 out of the 10 participants “strongly agreed” with (a) above and 1 “agreed”.

6 out of the 10 participants “strongly agreed” with (b) above and 4 “agreed”.

8 out of the 10 participants “strongly agreed” with (c) above and 2 “agreed”.  
10 out of the 10 participants “strongly agreed” with (d) above.

**The finding was:**

100% of the participants gained knowledge about trauma-informed practice, by attending the course specifically they gained interdisciplinary knowledge about TIP, knowledge about the possible impact of trauma on the functioning of the children in the classroom and, knowledge about the importance of viewing children through a trauma-informed lens.

**Questionnaire 1(g): The Knowledge of Montessori Questionnaire.**

*Prior attendance ‘Knowledge’ about Dr Montessori’s expertise in mental health and trauma*

Questionnaire 1(g) contained the following statements:

- (a) Prior to attendance at this CPD programme, I knew **nothing at all** about Dr Montessori and her interest and expertise in mental health, childhood trauma and trauma-informed practice because I am not a Montessori teacher.
- (b) Prior to attendance at this CPD programme, I knew **very little** about Dr Montessori and her interest and expertise in mental health, childhood trauma, and trauma-informed practice because it was NOT covered in my teacher training.
- (c) Prior to attendance at this CPD programme, I knew **a great deal** about Dr Montessori and her interest and expertise in mental health, childhood trauma, and trauma-informed practice because it was covered extensively in my teacher training.

Results:

3 out of the 10 participants “agreed” with (a) above, and 7 “disagreed”.  
9 out of the 10 participants “agreed” with (b) above, and 1 “strongly agreed”.  
6 out of the 10 participants “disagreed” with (c) above and 4 “strongly disagreed”.

**The finding was:**

90% of the participants knew very little about Dr. Montessori’s interest and expertise in mental health, childhood trauma, and trauma-informed practice prior to attendance at this CPD course because it was not covered in their teacher training.

## Questionnaire 1(h): The Knowledge of Montessori Questionnaire.

### *Post attendance 'Knowledge' about Dr Montessori's expertise in mental health and trauma*

Questionnaire 1(h) contained the following statements:

- (a) Following attendance at this CPD course, I have learnt a great deal about Dr Montessori and her interest and expertise in mental health and childhood trauma.
- (b) Following attendance at this CPD course, I have gained an understanding of how Dr Montessori used her materials and activities as 'tools' of healing.
- (c) Following attendance at this CPD course, I have gained an understanding of how Dr Montessori trained her teachers to be a 'source' of healing.
- (d) Following attendance at this CPD course, I have gained an understanding of how Dr Montessori created environments that were "places" of healing.
- (e) Following attendance at this CPD course, I have gained an understanding of how the Montessori Method shares many commonalities with current discoveries in neuroscience.

Results:

- 10 out of the 10 participants "strongly agreed" with (a) above.
- 9 out of the 10 participants "strongly agreed" with (b) above and 1 "agreed".
- 9 out of the 10 participants "strongly agreed" with (c) above and 1 "agreed".
- 8 out of the 10 participants "strongly agreed" with (d) above and 2 "agreed".
- 9 out of the 10 participants "strongly agreed" with (e) above and 1 "agreed".

### **The finding was: that by attendance at the CPD course**

100% of the participants increased their *Knowledge* about Montessori and her interest in, and involvement with mental health and trauma by attendance at this CPD course. Specifically, they gained knowledge about how Montessori used her materials, teachers, and environments as elements in the healing process, and about how the Montessori Method shares many commonalities with current discoveries in neuroscience.



## Questionnaire 2(a): The ATTITUDES to Trauma-Informed Approaches Questionnaire

Questionnaire 2 (a) contained the following statements:

- (a) I think children's "difficult" behaviours may be caused by what happened to them.
- (b) I think children's "difficult" behaviours are usually caused by their own inherent character flaws such as stubbornness/selfishness/badness.
- (c) I think that when children are emotionally dysregulated (ie not able to control their emotions) it is helpful to apply the model, Regulate, Relate, Reason (Perry) in that order.
- (d) I think that when children are emotionally dysregulated (ie not able to control their emotions) we need to apply strict discipline which may involve punishments.
- (e) I think that developing positive relationships with trauma-affected children experienced is vital.
- (f) I think that trying to develop positive relationships with trauma-affected children is a waste of time.
- (g) I think that finding a child's strengths and building on them could be a very effective way of helping a child to recover from traumatic experiences.
- (h) I think that It is a waste of time to look for a child's strengths, the child needs to just do what the others are doing and get on with life.
- (i) I think that a trauma-informed approach has the capacity to empower a trauma affected child whose experiences have left them feeling dis-empowered.
- (j) I think that children don't need to feel empowered, only adults do.
- (k) I think that a "whole school" approach is vital when the school wants to implement trauma informed practice.
- (l) I think that teachers are individuals, some may support TIP and some may not, the school can still be "trauma-informed" and "trauma responsive" even if some staff don't support it.

## Results

- 5 out of the 10 participants "strongly agreed" with (a) above, and 5 "agreed".
- 7 out of the 10 participants "strongly disagreed" with (b), 2 "disagreed" and 1 was neutral.
- 9 out of the 10 participants "strongly agreed" with (c) above, and 1 "agreed".
- 10 out of the 10 participants "strongly disagreed" with (d) above.
- 10 out of the 10 participants "strongly agree" with (e) above.
- 9 out of the 10 participants "strongly disagreed" with (f) above, and 1 "disagreed".
- 10 out of the 10 participants "strongly agreed" with (g) above.
- 10 out of the 10 participants "strongly disagreed" with (h) above.
- 10 out of the 10 participants "strongly agreed" with (i) above.
- 9 out of the 10 participants "strongly disagreed" with (j) above, and 1 "disagreed".
- 9 out of the 10 participants "strongly agreed" with (k) above, and 1 "disagreed".
- 5 out of the 10 participants "agreed" with (l) above, 1 "strongly agreed", 2 "disagreed" and 1 "strongly disagreed".

### **The findings were:**

- (a) 100% of the participants agreed that children’s “difficult” behaviours may be caused by what happened to them.
- (b) 90% of the participants disagreed with the statement that children’s “difficult” behaviours are usually caused by their own inherent character flaws such as stubbornness/selfishness/badness.
- (c) 100% of the participants agreed that when children are emotionally dysregulated (ie not able to control their emotions) it is helpful to apply the model, Regulate, Relate, Reason (Perry) in that order.
- (d) 100% of the participants strongly disagreed with the statement that when children are emotionally dysregulated (ie not able to control their emotions) we need to apply strict discipline which may involve punishments.
- (e) 100% of the participants strongly agreed with the statement that developing positive relationships with trauma-affected children is vital.
- (f) 100% of the participants strongly disagreed with the statement that trying to develop positive relationships with trauma-affected children is a waste of time.
- (g) 100% of the participants strongly agreed with the statement that finding a child’s strengths and building on them could be a very effective way of helping a child to recover from traumatic experiences.
- (h) 100% of the participants strongly disagreed with the statement that it is a waste of time to look for a child’s strengths, the child needs to just do what the others are doing and get on with life.
- (i) 100% of the participants strongly agreed with the statement that a trauma-informed approach has the capacity to empower a trauma affected child whose experiences have left them feeling dis-empowered.
- (j) 100% of the participants disagreed with the statement that children don’t need to feel empowered, only adults do.
- (k) 90% of the participants strongly agreed with the statement that a “whole school” approach is vital when a school wants to implement trauma informed practice.
- (l) 60% of the participants agreed with the statement that teachers are individuals, and some may support TIP and some may not, but the school can still be “trauma-informed” and “trauma responsive” even if some staff don’t support it.

### **The ATTITUDES to “Montessori” as a trauma-responsive approach Questionnaire.**

Questionnaire 2 (b) contained the following statements:

- (a) “Following attendance at this CPD course, I think that the historical evidence strongly suggests that the original Montessori Method was trauma responsive.”
- (b) “Following attendance at this CPD course, I think that blending original Montessori practices with contemporary recommendations for trauma-informed practice would be beneficial”.
- (c) “Following attendance at this CPD course, I think that Dr Perry’s “Regulate, Relate, and the Reason” model blends well with Montessori practices, because (i) many Montessori activities are “patterned, repetitive, and rhythmic” and so are calming and

regulating for children, (ii) much of Dr Montessori's instructions to teachers emphasizes the importance of building positive relations with children and treating them with respect, kindness, and love and (iii) much of Dr. Montessori's work advises that we should not reason with or correct children all the time, but rather wait until children show by their behaviour that they are receptive to listening to us and capable of hearing our words.

- (d) "Following attendance at this CPD course, I think that Montessori-influenced, trauma-informed practice would be very helpful to most Montessori and early childhood teachers".
- (e) "Following attendance at this CPD course, I think that all Montessori and early years teachers should be offered a module in trauma-informed practice as part of their training".

## Results

9 out of the 11 participants "strongly agreed" with (a) above, and 2 "agreed"  
9 out of the 11 participants "strongly agreed" with (b) above, and 2 "agreed"  
9 out of the 11 participants "strongly agreed" with (c) above, and 2 "agreed"  
10 out of the 11 participants "strongly agreed" with (d) above, and 1 "agreed"  
11 out of the 11 participants "strongly agreed" with (e) above.

The findings were:

100% of the participants agreed that the historical evidence strongly suggests that the original Montessori Method was trauma responsive.

100% of the participants agreed that blending original Montessori practices with contemporary recommendations for trauma-informed practice would be beneficial.

100% of the participants agreed that the "Regulate, Relate, and the Reason" model blends well with Montessori practices.

100% of the participants agreed that Montessori-influenced, trauma-informed practice would be very helpful to most Montessori and early childhood teachers.

100% of the participants agreed that Montessori and early years teachers should be offered a module in trauma-informed practice as part of their training.

### **Questionnaire 3 (a): The impact on Beliefs Questionnaire**

#### ***Prior attendance 'Beliefs' about childrens' behaviours:***

Questionnaire 3 (a) contained the following statements:

- (i) Prior to attendance at this CPD programme I believed that children with “difficult” behaviours (excluding sick children) were probably just being stubborn or perhaps selfishness.
- (ii) Prior to attendance at this CPD programme I believed that children with “difficult” behaviours (excluding sick children) were “choosing” to behave badly and that they could have behaved better if they tried”.

### **Results**

7 out of the 11 participants “agreed” with (i) above  
3 out of the 11 participants “disagreed” with (i) above  
1 out of the 11 participants was “neutral” to (i) above

1 out of the 11 participants “strongly agreed” with (ii) above  
2 out of the 11 participants “agreed” with (ii) above  
6 out of the 11 participants were “neutral” to (ii) above  
2 out of the 11 participants “disagreed” with (ii) above

### **The findings were:**

- (i) Prior to attendance at the Programme, approximately 70% of participants believed that children with “difficult” behaviours (excluding sick children) were probably just being stubborn or perhaps selfishness.
- (ii) Prior to attendance at the Programme, only 3% of participants believed that children with “difficult” behaviours (excluding sick children) were “choosing” to behave badly and that they could have behaved better if they tried”.

### **Questionnaire 3 (b): The impact on Beliefs Questionnaire**

#### ***Post attendance 'Beliefs' about childrens' behaviours:***

Questionnaire 3 (b) contained the following statements:

- (i) Following attendance at this programme, I believe that children with “difficult” behaviours (excluding sick children) may well be affected by something that happened to them which has caused them to become hyper-aroused (aggressive, unruly) or hypo-aroused (ie withdrawn, unnaturally quiet).
- (ii) Following attendance at this programme, I believe that children with “difficult” behaviours (excluding sick children) may not be deliberately “choosing” to behave badly but rather may have no conscious choice over their behaviours if they are in an alarm state.

### **Results**

6 out of the 11 participants “strongly agree” with (i) above

5 out of the 11 participants “agree” with (i) above

4 out of the 11 participants “strongly agree” with (ii) above

7 out of the 11 participants “agree” with (ii) above

The findings were:

Following programme participation, 100% of the participants agreed that children with “difficult” behaviours (excluding sick children) may well be affected by something that happened to them which has caused them to become hyper-aroused (aggressive, unruly) or hypo-aroused (ie withdrawn, unnaturally quiet).

Following programme participation, 100% of the participants agreed that children with “difficult” behaviours (excluding sick children) may not be deliberately “choosing” to behave badly but rather may have no conscious choice over their behaviours if they are in an alarm state.

## **Questionnaire 4 (a): The impact on Professional Practice Questionnaire.**

### ***Prior attendance professional practice***

Questionnaire 4 (a) contained the following statements:

- (a) “Prior to attendance at this CPD programme I would have been more inclined to ask “What’s wrong with this child?” rather than “What happened to this child?”.
- (b) “Prior to attendance at this CPD programme I would not have viewed children through a trauma-informed lens”.
- (c) “Prior to attendance at this CPD programme I would not have known about Dr. Perry’s advice that we need to ‘regulate, relate, and then reason’ with a child who has been affected by trauma, so I would not have done this”.
- (d) “Prior to attendance at this CPD programme I was not aware that Montessori activities could calm and regulate children, so I did not use them for regulation in my daily professional practice”.
- (e) “Prior to attendance at this CPD programme I was not aware of how neuroscience backs up Montessori’s use of Practical life activities and other Montessori repetitive, rhythmic activities to calm and regulate children.

## **Results**

3 out of the 11 participants “strongly agreed” with (a) above, 5 “agreed,” 2 were neutral  
2 out of the 11 participants “strongly agreed” with (b) above, 6 “agreed,” 3 were neutral  
5 out of the 11 participants “strongly agreed” with (c) above, and 6 “agreed”  
1 out of the 11 participants “strongly agreed” with (d) above, 5 “agreed,” 3 disagreed. 2 N.  
4 out of the 11 participants “strongly agreed” with (e) above, and 7 “agreed”

The findings were:

- (a) Nearly 80% agreed that prior to attendance, they would have been more inclined to ask “What’s wrong with this child?” rather than “What happened to this child?”.
- (b) Nearly 80% agreed that prior to participation, they would not have viewed children through a trauma-informed lens”.
- (c) 100% of the participants agreed that prior to attendance, they would not have known about the need to ‘regulate, relate, and then reason’ with a child who has been affected by trauma, so I would not have done this.
- (d) Nearly 60% agreed that prior to attendance, they were not aware that Montessori activities could calm and regulate children, so I did not use them for regulation in their daily professional practice
- (e) 100% of the participants agreed that prior to attendance, they were not aware of how neuroscience backs up Montessori’s use of Practical life activities and other Montessori repetitive, rhythmic activities to calm and regulate children.

## **Questionnaire 4(b): The impact on Professional Practice Questionnaire.**

### ***Post attendance professional practice***

Questionnaire 4 (b) contained the following statements:

- (a) Following attendance at this CPD programme I am more inclined to ask myself “What happened to this child?” rather than “What’s wrong with this child?”
- (b) “Following attendance at this CPD programme I now view children through a trauma-informed lens”.
- (c) “Following attendance at this CPD programme I now try to follow Dr. Perry’s ‘regulate, relate, and then reason’ model with trauma-affected children.
- (d) “Following attendance at this CPD programme I have changed some of my previous practices”.
- (e) “Following attendance at this CPD programme I have started to increase my usage of Montessori materials and activities to calm and regulate the children”.

## **Results**

- 5 out of the 11 participants “strongly agreed” with (a) above, and 6 “agreed”
- 4 out of the 11 participants “strongly agree” with (b) above, and 7 “agree”
- 6 out of the 11 participants “strongly agree” with (c) above, and 5 “agree”.
- 2 out of the 11 participants “strongly agree” with (d) above, and 9 “agree”
- 3 out of the 11 participants “strongly agreed” with (e) above, 7 “agreed,” 1=neutral

The findings were:

- (a) 100% agreed that following attendance, they are more inclined to ask “What happened to this child?” rather than “What’s wrong with this child?”
- (b) 100% agreed that following attendance, they now view children through a trauma-informed lens
- (c) 100% agreed that following attendance, they now try to follow Dr. Perry’s ‘regulate, relate, and then reason’ model with trauma-affected children.
- (d) 100% agreed that following attendance at the programme, they have changed some of their previous practices.
- (e) Nearly 100% agreed that following attendance at the programme, they started to increase their use of Montessori materials and activities to calm and regulate the children.

## Questionnaire 5: The Feasibility Questionnaire

Questionnaire 5 (a) contained the following statements:

- (a) “I think the current Government Guidelines on “Self- Regulation for Pupils”, which relies on Dr Perrys “Regulate, Relate and then Reason” model, will now make it easy to implement this CPD course in Montessori pre-school settings” because Montessori’s Method and Dr Perry’s model share many similarities, and the Dept. of Education is promoting Dr Perry’s model”.
- (b) “I think it will Not be difficult to put this Montessori-attuned, trauma-informed approach into practice in settings”.
- (c) “I think the current government pre-school policies, especially with the emphasis on a play-based curriculum, will make it difficult to implement this CPD course in settings”.
- (d) “I think it will be very difficult to put this Montessori-attuned, trauma informed approach into practice in settings”.

## Results

8 out of the 10 participants “strongly agreed” with (a) above, 1 “agreed” and 1 “disagreed”.  
6 out of the 10 participants “agreed” with (b) above, 3 “strongly agreed” and 1 “disagreed”.  
7 out of the 10 participants “strongly agreed” with (c) above, and 3 “agreed”.  
6 out of the 10 participants “disagreed” with (d) above, 2 “strongly disagreed” and 2 “agreed”.

The findings were:

- (a) 90% of participants agreed that Government Guidelines backing Dr. Perry’s model would make it easier to implement this CPD programme in settings.
- (b) 90% of participants agreed that it would NOT be difficult to put this Montessori attuned, trauma informed approach into practice in settings.
- (c) 100% of participants agreed that the emphasis on a play-based curriculum, will make it difficult to implement this CPD course in settings.
- (d) 80% of participants did not agree that it would be “very difficult” to put this Montessori-attuned, trauma informed approach into practice in settings, but 20% felt it would be.

One participant added this comment on the questionnaire form:

*“I think there will be a degree of difficulty implementing the course as it will change the way we work at present but when we see the evidence that it is working it will be relatively easy to continue putting it into practice”.*



## Questionnaire 6: The Experience of the programme Questionnaire

Questionnaire 6 contained the following statements:

- (a) I feel that attending this course has helped me to understand things in my own childhood and my own upbringing.
- (b) I believe that attending this course is helping me to be a better early years or Montessori professional.
- (c) I feel that attending this course is helping me in my non-professional life, ie in my interactions with my family and friends.
- (d) My experience of doing this CPD course, was a positive one, and I am glad that I attended it.
- (e) I would recommend this course to other early years and/or Montessori teachers.

## Results

5 out of the 11 participants “strongly agreed” with (a) above, and 5 “agreed,” 1 was neutral.  
6 out of the 11 participants “strongly agreed” with (b) above, and 5 “agreed”.  
4 out of the 11 participants “strongly agreed” with (c) above , and 7 “agreed”.  
11 out of the 11 participants “strongly agreed” with (d) above.  
10 out of the 11 participants “strongly agreed” with (e) above , and 1 “agreed”.

The findings were:

- (a) Over 90% of participants agreed that attending the course helped them to understand things in their own childhood and their own upbringing.
- (b) 100% of the participants agreed that attending this course was helping them to be a better early years or Montessori professional.
- (c) 100% of the participants agreed that attending the course was helping them in their non-professional life, i.e., in their interactions with family and friends.
- (d) 100% of the participants agreed that their experience of doing the CPD course, was a positive one, and were glad that they attended it.
- (e) 100% of the participants agreed that they would recommend the course to other early years and/or Montessori teachers.

## Questionnaire 7: Benefits Questionnaire

Questionnaire 7 contained the following statements:

- (a) Trauma informed practice has the capacity to benefit CHILDREN.
- (b) Trauma informed practice has the capacity to benefit TEACHERS.
- (c) Trauma informed practice has the capacity to benefit FAMILIES

### Results

- 9 out of the 10 participants “strongly agreed” with (a) above, and 1 “agreed”.
- 10 out of the 10 participants “strongly agreed” with (b) above.
- 9 out of the 10 participants “strongly agreed” with (c) above, and 1 “agreed”.

### The findings were:

100% of the participants “agreed” that trauma informed practice has the capacity to benefit children, teachers, and families.

## Questionnaire 8: Self-Care Questionnaire

Questionnaire 8 contained the following statements:

- (a) Self-care is a necessity, as the saying goes - *‘you can’t pour from an empty cup.*
- (b) Self-care is a luxury, there is no need for it.
- (c) Self-care is time-consuming therefore it is a waste of time.
- (d) It is true that self-care is time-consuming, but it is necessary for good mental health.
- (e) Physical self-care such as exercise, eating healthy foods, is vital for teachers.
- (f) Emotional self-care, such as spending time with friends and family, doing things you enjoy such as going to a dance class, watching a movie, relaxing at the spa, or lounging on the couch, is vital for teachers”.

### Results

- 9 out of the 10 participants “strongly agreed” with (a) above, and 1 “agreed”.
- 9 out of the 10 participants “strongly disagreed” with (b) above, and 1 “disagreed”.
- 9 out of the 10 participants “strongly disagreed” with (c) above, and 1 “strongly agreed”.
- 7 out of the 10 participants “strongly agreed” with (d) above, and 3 “agreed”.
- 7 out of the 10 participants “strongly agreed” with (e) above, and 3 “agreed”.
- 8 out of the 10 participants “strongly agreed” with (f) above, and 2 “agreed”.

### The findings were:

- (a) 100% agreed that self-care is a necessity.
- (b) 100% disagreed with the statement that self-care is a luxury and there is no need for it.

- (c) 90% disagreed with the statement that self-care is a waste of time.
- (d) 100% agreed that self-care is time-consuming but necessary for good mental health.
- (e) 100% agreed that physical self-care such as exercise, eating healthy foods, is vital for teachers.
- (f) 100% agreed that emotional self-care, such as spending time with friends and family, doing things you enjoy such as going to a dance class, watching a movie, relaxing at the spa, or lounging on the couch, is vital for teachers.

### **Questionnaire 9: The Desimone framework (2009) Questionnaire.**

Prior to handing out the 5-part questionnaire, the researcher explained to the participants the meaning of Desimone’s terms content focus, coherence, collective participation, active learning, and duration, as follows:

#### ***Content Focus:***

Content focus refers to the presence (or absence) of a focus on the intended subject matter (Desimone, 2009) – which in this case was (a) Dr. Montessori and the historical accounts of her healing schools, (b) childhood trauma and its impact and effects on children’s physical, emotional, social, and cognitive functioning, and (c) trauma-informed practice.

Questionnaire 9 (a) contained the following statement:

*“Overall, the content of the sessions focused on the intended subject matter as outlined in the learning objectives?”*

Results:

In this questionnaire, 10 out of the 10 participants “strongly agreed” to this statement.

The finding was:

100% of the participants agreed that the CPD programme showed the presence of the first critical feature of effective professional development – Content Focus.

#### ***Coherence:***

Coherence refers to how well-connected each session is to the sessions before and after them, and how they merged (or didn’t merge) into a unified whole. In addition, Desimone states that “The consistency of school, district, and state reforms and policies with what is taught in professional development is another important aspect of coherence (Desimone, 2009, p.184). Therefore, the present researcher sought to draw the attention of the participants towards the extent to which the content of this CPD programme was coherent with current Irish Department of Education directives and policies relating to the topic of “regulation” in children (especially in the context of COVID 19). In particular, the researcher drew the participants’ attention to two documents issued by the Irish National Educational Psychological Services (NEPS) –

“Self- Regulation for Pupils: A Guide for School Staff” (NEPS, n/d), and “The Response to Stress: Information for School Staff (NEPS, n/d). A copy of each of these documents was given to each participant during the final session.

Questionnaire 9 (b) contained the following statements:

- 1) *“I think the CPD programme was coherent (logical and consistent)”*.
- 2) *“I think the CPD programme was well designed, clear and easy to follow”*
- 3) *“I think the CPD sessions flowed from one session to the next, resulting in a unified whole”*

9 out of the 10 participants “strongly agreed” with (a) above and one “agreed”.

10 out of the 10 participants “strongly agreed” with (b) above.

10 out of the 10 participants “strongly agreed” with (c) above.

The finding was:

100% of the participants agreed that the CPD programme showed the presence of the second critical feature of effective professional development – Coherence.

### ***Collective Participation:***

Collective participation refers to the presence at the CPD sessions of teachers from the same school and the opportunities afforded to them to discuss/reflect on the topics being presented. Desimone states that “such arrangements set up potential interaction and discourse, which can be a powerful form of teacher learning” (Desimone, 2009, p. 184).

Questionnaire 9 (c) contained the following statements:

- (a) *“I think it was beneficial that teachers from the same school/creche attended the CPD programme together”*.
- (b) *“Teachers were given opportunities to discuss/reflect together on issues arising from the course material”*.
- (c) *“I found that opportunities to discuss/reflect on topics related to the course material were useful and/or valuable”*.
- (d) *“I think doing CPD with other staff members of your school/creche is more beneficial than doing CPD alone because you can share ideas relating to your particular setting”*.

10 out of the 10 participants “strongly agreed” with (a) above.

10 out of the 10 participants “strongly agreed” with (b) above.

10 out of the 10 participants “strongly agreed” with (c) above.

10 out of the 10 participants “strongly agreed” with (d) above.

The finding was:

100% of the participants agreed that the CPD programme showed the presence of the third critical feature of effective professional development – Collective Participation.

***Active Learning:***

Active learning involves giving opportunities to teachers attending the CPD sessions to engage in activities that relate to the content of the CPD programme. This can take a number of forms including observing expert teachers explaining how they translate theory to practice, followed by group discussion.

Questionnaire 9 (d) contained the following statements:

- (a) *“The active learning (for example, observing video clips of experts (such Dr Vincent Felitti discussing the origins of the ACE Study, followed by a clip of Dr Nadine Burke Harris discussing her application of the ACE Study in her clinical work) followed by group discussion was beneficial”.*
- (b) *“The demonstration and discussion of ‘affirmation circles’ for children was helpful and thought-provoking”.*

6 out of the 10 participants “strongly agreed” with (a) above and 4 “agreed”.

10 out of the 10 participants “strongly agreed” with (b) above.

The finding was:

100% of the participants agreed that the CPD programme showed the presence of the fourth critical feature of effective professional development – Active Learning.

***Duration:***

Duration refers to the span of time over which the delivery of the CPD programme is spread (eg over one day, one weekend, or over one or more semesters) and the number of hours allocated to each individual session (eg 3 hours in a morning only, or 3 hours in a morning plus and 2 hours in the afternoon, etc). Desimone states that “research has not indicated an exact “tipping point” for duration but shows support for activities that are spread over a semester ... and include 20 hours or more of contact time” (Desimone, 2009, p. 184). Simply put, the longer the time over which a CPD program is spread, the better the impact. The minimum number of contact hours required to achieve optimal learning is 20. The delivery of the CPD programme for this PhD project took 20 hours.

Questionnaire 9 (e) contained the following statements:

In part 5 of the questionnaire, participants were asked to reply to the statements:

- (a) *“I think the duration of the CPD programme (20 hrs - 4 five-hours) was too short”.*
- (b) *“I think the duration of the CPD programme (20 hrs - 4 five-hours) was too long”.*
- (c) *“I think the duration of the CPD programme (20 hrs - 4 five-hours) was just right”.*

**Results:**

8 out of the 10 participants “disagreed” with (a) above and 2 “strongly disagreed”.

7 out of the 10 participants “disagreed” with (b) above and 3 “strongly disagreed”.

7 out of the 10 participants “strongly agreed” with (c) above and 3 “agreed”.

**The finding was:**

100% of the participants agreed that the duration of the CPD programme was “just right”.

## Appendix E

### Brief Summary of Questionnaire results

Questionnaire	Finding
<b>1 (a) &amp; (b)</b>	<b>The knowledge of ACEs questionnaire</b>
1(a)	70% of the participants stated that they knew <b>“nothing”</b> about ACEs prior to attendance at this course.
1(b)	100% of the participants agreed that they gained knowledge about ACEs by attending this course.
<b>1 (c) &amp; (d)</b>	<b>The Knowledge of Trauma Questionnaire.</b>
1(c)	100% of participants stated that they had <b>minimal</b> knowledge about trauma, prior to attendance at this course.
1(d)	100% of the participants stated that they gained knowledge about trauma, by attending this course.
<b>1 (e) &amp; (f)</b>	<b>The Knowledge of Trauma-Informed Practice Questionnaire.</b>
1(e)	100% of participants stated that they had <b>minimal</b> knowledge about trauma-informed practice, prior to attendance at the course.
1(f)	100% of the participants stated that they gained knowledge about trauma-informed practice, by attending the course.
<b>1 (g) &amp; (h)</b>	<b>The Knowledge of Montessori Questionnaire.</b>
1(g)	90% of the participants stated that they knew very little about Dr. Montessori’s interest and expertise in mental health, childhood trauma, and trauma-informed practice prior to attendance at this CPD course because it was not covered in their teacher training.
1(h)	100% of the participants stated that they increased their <i>Knowledge</i> about Montessori and her interest in, and involvement with mental health and trauma by attendance at this CPD course.

---

**2 (a)**

**The ATTITUDES to Trauma-Informed Approaches Questionnaire**

- (m) 100% of the participants agreed that children's so-called "difficult" behaviours may be caused by what happened to them.
- (n) 90% of the participants disagreed with the statement that children's so-called "difficult" behaviours are usually caused by their own inherent character flaws such as stubbornness/selfishness/badness.
- (o) 100% of the participants agreed that when children are emotionally dysregulated (ie not able to control their emotions) it is helpful to apply the model, Regulate, Relate, Reason (Perry) in that order.
- (p) 100% of the participants strongly disagreed with the statement that when children are emotionally dysregulated (ie not able to control their emotions) we need to apply strict discipline which may involve punishments.
- (q) 100% of the participants strongly agreed with the statement that developing positive relationships with trauma-affected children is vital.
- (r) 100% of the participants strongly disagreed with the statement that trying to develop positive relationships with trauma-affected children is a waste of time.
- (s) 100% of the participants strongly agreed with the statement that finding a child's strengths and building on them could be a very effective way of helping a child to recover from traumatic experiences.
- (t) 100% of the participants strongly disagreed with the statement that it is a waste of time to look for a child's strengths, the child needs to just do what the others are doing and get on with life.
- (u) 100% of the participants strongly agreed with the statement that a trauma-informed approach has the capacity to empower a trauma affected child whose experiences have left them feeling dis-empowered.
- (v) 100% of the participants disagreed with the statement that children don't need to feel empowered, only adults do.
- (w) 90% of the participants strongly agreed with the statement that a "whole school" approach is vital when a school wants to implement trauma informed practice.
- (x) 60% of the participants agreed with the statement that teachers are individuals, and some may support TIP and some may not, but the school can still be "trauma-informed" and "trauma responsive" even if some staff don't support it.





#### **4 (a) & (b)**

#### **The impact on Professional Practice Questionnaire**

##### **4 (a)**

- (f) Nearly 80% agreed that prior to attendance, they would have been more inclined to ask “What’s wrong with this child?” rather than “What happened to this child?”.
- (g) Nearly 80% agreed that prior to participation, they would not have viewed children through a trauma-informed lens”.
- (h) 100% of the participants agreed that prior to attendance, they would not have known about the need to ‘regulate, relate, and then reason’ with a child who has been affected by trauma, so I would not have done this.
- (i) Nearly 60% agreed that prior to attendance, they were not aware that Montessori activities could calm and regulate children, so I did not use them for regulation in their daily professional practice
- (j) 100% of the participants agreed that prior to attendance, they were not aware of how neuroscience backs up Montessori’s use of Practical life activities and other Montessori repetitive, rhythmic activities to calm and regulate children.

##### **4(b)**

- (f) 100% agreed that following attendance, they are more inclined to ask “What happened to this child?” rather than “What’s wrong with this child?”
  - (g) 100% agreed that following attendance, they now view children through a trauma-informed lens
  - (h) 100% agreed that following attendance, they now try to follow Dr. Perry’s ‘regulate, relate, and then reason’ model with trauma-affected children.
  - (i) 100% agreed that following attendance at the programme, they have changed some of their previous practices
  - (j) Nearly 100% agreed that following attendance at the programme, they started to increase their use of Montessori materials and activities to calm and regulate the children.
-

## **5 The Feasibility Questionnaire**

- (e) 90% of participants agreed that Government Guidelines backing Dr. Perry’s model would make it easier to implement this CPD programme in settings.
  - (f) 90% of participants agreed that it would NOT be difficult to put this Montessori attuned, trauma informed approach into practice in settings.
  - (g) 100% of participants agreed that the emphasis on a play-based curriculum, will make it difficult to implement this CPD course in settings.
  - (h) 80% of participants did not agree that it would be “very difficult” to put this Montessori-attuned, trauma informed approach into practice in settings, but 20% felt it would be.
- 

## **6 The Experience Questionnaire**

100% of the participants agreed that attending the programme was a positive and helpful experience and they would recommend it to others.

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## **7 The Benefits of TIP Questionnaire**

100% of the participants “agreed” that trauma informed practice has the capacity to benefit children, teachers, and families.

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## **8 The Self- Care Questionnaire**

100% agreed that self-care is a necessity.  
100% disagreed with the statement that self-care is a luxury.  
90% disagreed with the statement that self-care is a waste of time.  
100% agreed that self-care is time-consuming but necessary for good mental health.  
100% agreed that physical self-care such as exercise, eating healthy foods, is vital for teachers.  
100% agreed that emotional self-care, such as spending time with friends and family, doing things you enjoy such as going to a dance class, watching a movie, relaxing at the spa, or lounging on the couch, is vital for teachers.

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9

**The CPD evaluation (Desimone, 2009) Questionnaire**

9(a) **100% of the participants agreed** that the CPD programme showed the presence of the first critical feature of effective professional development – Content Focus.

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9(b) **100% of the participants agreed** that the CPD programme showed the presence of the second critical feature of effective professional development – Coherence.

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9(c) **100% of the participants agreed** that the CPD programme showed the presence of the third critical feature of effective professional development – Collective Participation.

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9(d) **100% of the participants agreed** that the CPD programme showed the presence of the fourth critical feature of effective professional development – Active Learning.

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9(e) **100% of the participants agreed** that the duration of the CPD programme was “just right”.

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## Appendix F



**Maynooth University  
Department of Education**

This form is to accompany the submission of a PhD that contains research reported in published or unpublished work. **Please include one copy of this form for each co-authored work.** This form along with the published work should, under normal circumstances, appear in an Appendix.

### Authorship Declaration Form

**Publication Details:**

Thesis Chapter/Pages	Chapter 4
Publication title	Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education.
Publication status	Published
Type of publication	Article
Publication citation	Phillips, B., O'Toole, C., McGilloway, S., Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. <i>Journal of Montessori Research</i> . Vol. 8(1). 13-28.



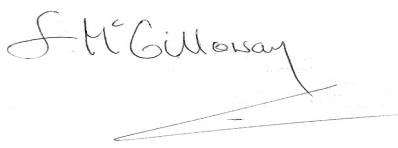

**Nature/extent of my contribution to the work detailed above is as follows:**

Nature/Extent of Contribution	Lead author
Bernadette Phillips made a 70% contribution to this manuscript.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**The following co-authors contributed to the work (all contributing co-authors):**

Name	Nature of contribution
C. O'Toole	Made a 10% contribution to this manuscript
S. McGilloway	Made a 10% contribution to this manuscript
S. Phillips	Made a 10% contribution to this manuscript

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-author's contribution to this work

	Name	Signature	Date
Student	Bernadette Phillips		13/8/2024
Co-author 1	Catriona O'Toole		02/09/2024
Co-author 2	Sinead McGilloway		31/8/2024
Co-author 3	Stephen Phillips		13/8/2024

This form is to accompany the submission of a PhD that contains research reported in published or unpublished work. **Please include one copy of this form for each co-authored work.** This form along with the published work should, under normal circumstances, appear in an Appendix.

### Authorship Declaration Form

**Publication Details:**

Thesis Chapter/Pages	CHAPTER 5
Publication title	Does the Montessori Approach to Healing Trauma-Affected Children Align with the 'Regulate, Relate, and Reason' phase of the NME? A thematic analysis.
Publication status	Under Review
Type of publication	Article
Publication citation	Phillips, B. (Under Review). Does the Montessori Approach to Healing Trauma-Affected Children Align with the 'Regulate, Relate, and Reason' phase of the NME? A thematic analysis. <i>Journal of Child and Adolescent Trauma</i> .

**Nature/extent of my contribution to the work detailed above is as follows:**

Nature/Extent of Contribution	Lead author
This is a sole authored paper. No other person contributed to it.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**The following co-authors contributed to the work (all contributing co-authors):**

Name	Nature of contribution

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-author's contribution to this work

	Name	Signature	Date
Student	Bernadette Phillips	<i>Bernadette Phillips</i>	13/August/24
Co-author 1			
Co-author 2			
Co-author 3			



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Nature/Extent of Contribution	Lead author
This is a sole authored paper. No other person contributed to it.	<input checked="" type="checkbox"/> Yes  <input type="checkbox"/> No

**The following co-authors contributed to the work (all contributing co-authors):**

Name	Nature of contribution

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-author's contribution to this work

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The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-author's contribution to this work

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## Appendix G

Articles published and articles under review



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# Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education

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*Keywords:* Montessori, the White Cross, trauma-informed, childhood adversity/trauma, education

**Abstract:** Childhood adversity and trauma are pervasive and have powerful, far-reaching consequences for health and well-being. Recent years have seen increased recognition of the need for trauma-informed practice, which aims to promote understanding, healing, and the prevention of retraumatization. Historical data show that the early Montessori schools were known internationally as healing schools, wherein children affected by adversity or trauma were apparently healed on a considerable scale. This study presents the findings from a documentary analysis of three primary sources, namely, Maria Montessori’s own original accounts, eyewitness accounts, and media reports pertaining to this healing aspect of the early Montessori schools. The findings demonstrate that, first, from the beginning of her career, Montessori worked with children who had experienced significant exposure to adversity or trauma, second, that her Montessori Method was shown to effect healing or recovery in these children, and third, that her long involvement with trauma-affected children directly led to her later attempts to set up an organization to be called the White Cross, which was to incorporate, among other things, a trauma-informed course for teacher–nurses. In this innovative approach to Montessori studies, we argue that Montessori was ahead of her time, that her work is even more relevant today in the context of adversity and trauma research, and that her methods, principles, and approaches may be harnessed and used in ways that promote trauma-informed practice in contemporary education settings.

*Children have many kinds of sensitiveness, but they are all alike in their sensitiveness to trauma.*  
(Montessori, *The Absorbent Mind*, 1967, p. 131)

Maria Montessori (1870–1952) was a woman ahead of her time. In 1896 she was one of the first women in Italy to obtain a double honors degree in medicine and surgery; she was remarkable in that her doctoral thesis

was based on a psychiatric topic even though psychiatry was a relatively new branch of medicine at that time (Kramer, 1976). After receiving her medical degree, Montessori furthered her research in psychiatry such that,



as early as 1897, she was recognized as a knowledgeable clinical psychiatrist (Povell, 2010) and an expert in childhood mental illness (Guttek & Guttek, 2017). As Babini stated, she went on to carve out “a remarkable career: from psychiatrist to educationalist” (Babini, 2000, p. 45). In 1896, she began her career with children who suffered the double burden of being both developmentally challenged and victims of adversity and trauma (in the form of emotional and educational neglect), and she continued for the next 20 years to be involved with children who had suffered significant exposure to adversity and traumatic experiences (e.g., the children of San Lorenzo who grew up in one of the poorest slum districts in Rome; the children of Messina and Reggio Calabria who survived a devastating earthquake that left most of them orphaned and homeless; and the French and Belgian children who were exposed to the horrors of war, which left many severely traumatized; Phillips & Phillips, 2016). All of these children were exposed to what we would now call adverse childhood experiences (ACEs; Felitti et al., 1998).

*Adverse childhood experience* originally described exposure before the age of 18 to stressors such as abuse, neglect, domestic violence, parental separation, household substance misuse, and family mental health issues (Felitti et al., 1998). In more recent years, however, the importance of other adversities, such as homelessness, poverty, racism, and other inequalities, has been recognized by leading organizations such as the National Scientific Council on the Developing Child (2020) at Harvard University. These types of experience overlap with what is considered *childhood trauma*, which refers to exposure to either single or multiple overwhelmingly stressful experiences that can leave children psychologically and biologically damaged (Burke Harris, 2019; Herman, 2015; Perry et al., 1995; Perry & Winfrey, 2021; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014; van der Kolk, 2014). A vast and compelling body of research demonstrates that traumatic experiences have a detrimental impact on brain development and cognitive, social, and emotional functioning, thereby affecting a child’s ability to learn, form relationships, and function appropriately at school (Cole et al., 2005; Craig, 2016; Perry & Szalavitz, 2017; Treisman, 2017; Wolpow et al., 2016). This effect has led to increasing recognition of the need for schools and other human-service settings to become trauma informed and trauma responsive by implementing *trauma-informed practice* (TIP; Alexander, 2019; Jennings, 2019; Maynard et al., 2019; Overstreet & Chafouleas, 2016; Thomas et

al., 2019). TIP is an approach that aims to understand the impact of trauma on an individual’s life and respond in a manner that offers safety, both physical and emotional, to that individual, as well as prevent retraumatization. It also seeks to empower people to reestablish control over their lives (SAMHSA, 2014). TIP acknowledges the prevalence of trauma, as well as the biological, social, and psychological consequences of trauma on an individual’s affect and behavior (Cole et al., 2005; Wolpow et al., 2016). The key principles of trauma-informed practice are accepted as safety, trustworthiness, choice, collaboration, empowerment, and respect for diversity (Fallot & Harris, 2009).

In this paper we argue that the concept of trauma-informed care in the early childhood years is not necessarily a new one. For example, it is not widely known, by either teachers or the general public, that Montessori had a strong “interest in psychological trauma in children” (Scocchera, 2002/2013, p. 49) and a long involvement with children who were exposed to adversity or trauma. We argue that her involvement with four specific groups of children—first, the “persecuted,” “neglected” and “rejected” children from the Manicomio di Roma (the psychiatric hospital of Rome, usually referred to historically and by Montessori as the asylum”; Montessori, 2008, p. 263); second, the “tearful, frightened children” of San Lorenzo (Montessori, 1936, p. 123); third, the “numbed, silent, absent-minded” children of Messina–Reggio (Montessori, 1936, p. 152); and fourth, the “psychologically or mentally mutilated” French and Belgian children (Montessori, 1917/2013, p. 39)—arguably represented significant efforts on her part to support children suffering from the effects of adversity and trauma (Kramer, 1976; Mayfield, 2006; Montessori, 1917/2013; Moretti, 2021). This involvement with trauma-affected children, combined with her attempts in 1916 and 1917 to train teachers and nurses in “special methods of education” (Montessori, 1917/2013, p. 40) to facilitate healing from psychological trauma (as part of the work of an organization she intended to call the White Cross), further represented significant efforts on her part to support children suffering the ongoing effects of trauma (Kramer, 1976; Mayfield, 2006; Montessori, 1917/2013; Moretti, 2021; Trabalzini, 2013). These vivid and explicit descriptions by Montessori herself, of children damaged by psychological trauma that subsequently led to their inability to learn, were the inspiration for our argument that Montessori’s interest in and long involvement with psychological trauma

culminated in her plan to design and deliver a trauma-informed course to teachers and nurses to enable them to understand the effects of adversity and trauma on children and to give them the skills to help these children to heal and recover. It would appear, therefore, that Montessori's approach to education and care was very much shaped by her interest in childhood trauma, but her contribution in this respect has not yet been fully investigated.

This paper reports the first stage of a larger, three-stage study designed to investigate the extent to which Montessori's practices and principles may be harnessed to develop a new professional-development course designed to help teachers better understand and implement trauma-informed practice in early childhood education. The overarching aim of this three-stage study is to support children affected by trauma by introducing and scientifically testing (in stages 2 and 3 of the study) Montessori-attuned, trauma-informed practice. The specific objectives in this first stage are to explore the historical, documentary evidence to identify and critically describe Montessori's involvement with children who had suffered psychological trauma, her descriptions of the presentation of that trauma, and her approach to healing and recovery.

## Method

The specific research question underpinning this study is "What is the historical evidence supporting the claims that Montessori offered a healing environment?" To answer this question, we conducted a qualitative documentary analysis (two authors are Montessori practitioners and researchers; one is an academic with particular expertise in school-based, trauma-informed practice; and one is a senior academic involved in mental health and the well-being of children and families), in line with the approach recommended by Bowen (2009). A total of 12 documents relating to Montessori's work between 1898 and 1917 (i.e., eyewitness accounts, media reports, and Montessori's own accounts) and specifically to the four specific groups of children referred to earlier were procured and scrutinized (see Table 1). These sources yielded a large amount of data, consisting of excerpts, quotations, passages, and entire books that were selected for analysis. Braun and Clarke's analytical model (2006) was used. Specifically, the historical material was examined and categorized into themes, and then

the theoretical concepts (as outlined in the theoretical framework below) shaped the final identified themes.

## Theoretical Framework

This study is anchored in the concept of trauma and guidance for a trauma-informed approach adopted by the SAMHSA (2014). Contemporary research and theory in trauma studies demonstrates the impact of exposure to adversity and traumatic events on the mind and the body (Felitti et al., 1998; van der Kolk, 2014). After exposure to chronic adversity or traumatic events, children often become either hyperaroused (i.e., reactive, aggressive, hypervigilant), hypoaroused (i.e., numb, detached, dissociated), or a mixture of both, and these states can become habitual (Perry et al., 1995). These states have a negative effect on the child's ability to learn, develop relationships, and function appropriately in schools (Cole et al., 2005). There is a need, therefore, for teachers to be aware of how exposure to adversity and trauma affects both the behavior and emotional responses of the child, and of how to prevent retraumatization and promote recovery (Craig, 2016).

## Results

Three major themes were identified from the analysis: (a) Montessori's long involvement with childhood adversity and trauma, (b) how the Montessori Method facilitated healing from the effects of adversity and trauma, and (c) Montessori's proposal for an intensive, trauma-informed course for teachers and nurses as part of the White Cross organization. We review each theme.

### Montessori's Long Involvement With Childhood Adversity and Trauma

The first theme identified from the analysis relates to Montessori's long involvement with childhood adversity and trauma. It was evident that the four groups of children described earlier, whom Montessori encountered during a 19-year period (from 1898 to 1917), had been exposed to significant adversity and trauma before they came under the beneficial influence of Montessori's Method. Each group is described below.

#### *The Children From the Roman Psychiatric Hospitals (1898): A Background of Deprivation and Trauma*

In 1897, a year after graduating as a medical doctor, Montessori became a voluntary assistant at

**Table 1***Chronological List of Data Sources*

Author and date	Title of document	Type and length of document
M. Montessori (1936)	<i>The Secret of Childhood</i>	Book (239 pages)
M. Montessori (1917)	<i>The White Cross</i>	Pamphlet (5 pages)
M. Cromwell (1916)	<i>The Montessori Method: Adapted to the Little French and Belgian Refugees</i>	Pamphlet (3 pages)
M. Montessori (1915)	<i>Articles from the San Francisco Call and Post</i>	Newspaper articles (82 pages)
C. Bailey (1915)	<i>Montessori Children</i>	Book (117 pages)
J. White (1914)	<i>Montessori Schools as Seen in the Early Summer of 1913</i>	Book (185 pages)
R. Marguiles (1913)	<i>Dr. Montessori and Her Method</i>	Journal article (7 pages)
D. C. Fisher (1912)	<i>A Montessori Mother</i>	Book (240 pages)
M. Montessori (1912)	<i>The Montessori Method</i>	Book (277 pages)
A. George (1912)	<i>Dr. Maria Montessori: The Achievement and Personality of an Italian Woman Whose Discovery Is Revolutionizing Educational Methods</i>	Magazine article (6 pages)
E. Y. Stevens (1912)	<i>The Montessori Method and the American Kindergarten</i>	Magazine article (6 pages)
J. Tozier (1911)	<i>An Educational Wonder-Worker: The Methods of Maria Montessori</i>	Magazine article (17 pages)

the psychiatric clinic affiliated with the University of Rome. Here, she worked alongside the eminent child specialist Clodomiro Bonfigli, who was conducting research on mental health disorders in children (Gutek & Gutek, 2017) and had a particular interest in the social determinants of mental illness (Povell, 2010). As Trabalzini pointed out, “she thus joined the psychiatric clinic’s work group that saw the cooperation of illustrious scientists” (Trabalzini, 2011, p. 17). As part of her work, the young Montessori was required to go into the “asylums” (Montessori, 1964, p. 31) to identify suitable candidates to take back to the clinic for study. It was in this capacity that she first became involved with children who, because they were unable to function at school or in their homes, were placed in these institutions that offered them no opportunities for learning or development.

In a series of newspaper articles published in 1915, Montessori reflected on the deprivation these children had suffered in these institutions and highlighted the facts that the children belonged to the poorest classes,

were “persecuted and neglected even by their parents,” and were excluded from education (Montessori, 2008, p. 263). According to her biographer, the children were “herded together like prisoners in a prison like room” (Standing, 1957, p. 28). Their days alternated between eating, sleeping, and staring into space. Their caretaker told Montessori with disgust how “after their meals, they would throw themselves on the floor to grab for dirty crumbs of bread” (Kramer, 1976, p. 58). Montessori observed that the children had no toys or materials of any kind and that the room was completely bare (Standing, 1957). She immediately recognized that these were not greedy children looking for more bread but were human beings, starved of emotional and intellectual stimulation and who therefore were using the breadcrumbs as playthings or learning materials (Kramer, 1976). In today’s terms, we would say these children were being exposed to severe neglect (Felitti et al., 1998).

In her efforts to understand the cognitive, social, and emotional problems evident in these children,

Montessori's research led her to the work of two almost forgotten French physicians, Jean-Marc-Gaspard Itard (1774–1838) and Édouard Séguin (1812–1880). The work of both doctors was to have a profound impact on Montessori's approach to teaching developmentally challenged children, and later, children in general. Itard had dedicated years of his career to attempts to remediate a child referred to as *the Wild Boy of Aveyron*, a mute, feral child found running wild in the forests of France. Although this boy is usually referred to as a mentally challenged child, there is evidence that he was also a severely traumatized child. It is arguable that Itard's methods, which so intrigued Montessori and had a profound influence on her, had as much relevance to the treatment of traumatized children as they had to the treatment of mentally challenged children. It is significant that the American journalist Josephine Tozier (who had spent months in Rome in 1910 talking with Montessori about her work with children and her sources of inspiration) wrote the first in a series of articles on Montessori's work that were key in launching the Montessori movement in America. Tozier began by telling the story of the Wild Boy of Aveyron and stated in her very first paragraph that this story "formed the starting-point of a process of thought and experiment" in Montessori's mind. Tozier wrote:

*In a forest of the Department of Aveyron, France, some hunters, in 1798, caught a wild boy, apparently eleven or twelve years of age. His body was covered with scars, caused by briars, thorns, and the teeth of animals; but one scar on his throat seemed to show that whoever left him in the forest had first tried to murder him.* (Tozier, 1911, p. 3)

Itard's writings, which meticulously record his attempts to remediate this undeniably traumatized child (who had suffered unimaginable physical and emotional abuse and neglect), as well as the later work and research carried out by Itard's disciple and successor Séguin, had a huge impact on Montessori. Based on her talks with Montessori, Tozier wrote that the work of these two doctors "fell in with [Montessori's] own line of thought, giving precision and certainty to ideas already germinating in her mind" (Tozier, 1911, p. 4) and led directly to Montessori's work in the Scuola Magistrale Ortofrenica [Orthophrenic School] in Rome (Tozier, 1911, p. 4), of which Montessori was a codirector. It is arguable that through her own

observations and the recorded observations of these two doctors, Montessori was beginning to link the impact of adversity and traumatic experience with cognitive, social, and emotional functioning, or what she called (when referring to the children she worked with in 1897) "moral and mental incapacity" (Montessori, 2008, pp. 263–264). In this respect, she was more than 100 years ahead of contemporary literature on the topic (Cole et al., 2005; Felitti et al., 1998; Perry & Szalavitz, 2017; Treisman, 2017).

### ***The Children of San Lorenzo (1907): A Background of Poverty and Neglect***

Several years later, in the early 1900s, Montessori began what was to become her acclaimed work in San Lorenzo in Rome, an extremely impoverished district in which an Italian building society sought to bring social improvements by providing tenement accommodation that would include a day-care facility for "all the little ones between the ages of three and seven" who were unable to attend the public schools (Montessori, 1964, p. 43). Foschi (2008) stated that Montessori, who had become well known "as a pedagogical expert" (p. 243), was invited "to direct the educational activities" of these facilities (p. 244). On Sunday, January 6, 1907, the first Children's House, as the facilities were called, was officially opened in a refurbished tenement in the slums of San Lorenzo. In *The Secret of Childhood*, (1936), Montessori included a quotation that she referred to as "something I wrote long ago, which I have discovered in a heap of old papers, which may be of documentary interest" (p. 120). The quotation paints a vivid picture of the children's tearful entry to the Casa dei Bambini and the poverty and neglect to which they had been exposed:

*They were tearful, frightened children, so shy that it was impossible to get them to speak; their faces were expressionless, with bewildered eyes as though they had never seen anything in their lives. They were indeed poor, abandoned children, who had grown up in dark, tumbledown, slum dwellings, with nothing to stimulate their minds, and without care. Everyone could see they suffered from malnutrition; it was not necessary to be a doctor to recognize that they were in urgent need of food, open air life, and sunlight.* (Montessori, 1936, p. 123)

These children had experienced chronic poverty and neglect, or what we would today refer to as ACEs (Felitti et al., 1998), and Montessori immediately recognized

that their emotional and social anxieties were inextricably linked to this experience.

### ***The Children of Messina and Reggio Calabria (1908): A Sudden Exposure to Adversity and Trauma***

Not long afterward, on December 28, 1908, at approximately 5:20 a.m., a violent earthquake hit Messina and Reggio Calabria with devastating force. The quake was followed within minutes by a powerful tsunami that caused 40-foot tidal waves to crash down on the coastal cities, reducing this area to little more than a heap of rubble (Pino et al., 2008). Thousands were trapped under the debris, suffering horrific and mostly fatal injuries. The death toll was estimated to be in the region of 80,000 to 100,000 (Bressan, 2012; Pino et al., 2008). There were some survivors, many of them children who “were left traumatized, homeless, and orphaned” (Mayfield, 2006, p. 5). Some were found days after the earthquake, wandering around in the ruins, shocked and traumatized. The earthquake left many children orphaned, and there was an urgent need to protect the survivors from further trauma. Through the press, the Italian government called on all those who could help these children to step forward (Moretti, 2014).

In *The Secret of Childhood*, Montessori (1936) reported that 60 children were accommodated in a specially formed Montessori school, which Anne George (1912) reported was located in the Franciscan convent on Via Giusti, under the patronage of Queen Margherita of Italy. Subsequently, in 1910, the nuns received training in the Montessori Method (Kramer, 1976). Montessori described the traumatized state of the children:

*Here were orphans who had survived one of the greatest catastrophes, the Messina earthquake (1908), sixty small children discovered among the ruins. No one knew either their names or their social status.... This terrible shock had reduced them to near uniformity, they were numbed, silent, absent-minded. It was hard to make them eat, hard to get them to sleep. At night they could be heard screaming and crying. (Montessori, 1936, p. 152)*

In this passage, Montessori shows her understanding that this terrible shock had traumatized the children, causing them to display what we would now refer to as posttraumatic stress.

### ***The Children of France and Belgium (1916): A Protracted Exposure to Adversity and Trauma***

Almost 10 years later, in the summer of 1916, when Europe was in the throes of the First World War, Montessori made a short visit to France to inspect the Montessori schools there (Montessori, 1917/2013). She found that all of the Montessori schools had been forced to close, as teachers dedicated themselves to helping the Red Cross (Montessori, 1917/2013). However, she found that there was one notable exception—an American teacher named Mary Cromwell, who had been trained in the Montessori Method of education and had personally organized and funded Montessori classes for French and Belgian refugee children (Montessori, 1917/2013). Cromwell witnessed firsthand the traumatizing impact of war on children. In a pamphlet she published in 1916 to raise funds to support her work with these war-torn children, she graphically described the various psychological presentations of the children. Some children were numb and unresponsive: “A sort of stupor invaded them and rendered them, for a long time, incapable of interest in anything” (Cromwell, 1916). Other children were in a constant state of alertness:

*[The children’s] perpetual plans were to pile up the material, even the heaviest objects, as if haunted by the desire to reconstruct; or their acts reflected the scenes they had lived through in their invaded villages. With their small chairs and tables, they improvised cellars in which to hide most of the day, and the boys showed great enthusiasm in carrying, as guns, the long bars intended to commence arithmetic, these agitated days were repeated for weeks. (Cromwell, 1916)*

Montessori vividly described the kind of psychological disturbance evident in the children:

*There is found, in these refugee children, a special form of mental disturbance, which constitutes a real mental wound—a lesion that is as serious as, if not more serious, than wounds in the physical body.... These children came to her (Miss Cromwell) in a state of stupor, incapable of understanding, frightened at the approach of anyone, afraid by day as well as by night. (Montessori, 2017/2013, p. 37)*

Montessori believed that these children were suffering from deep-rooted psychological difficulties: “these unfortunate little ones...are psychologically or

mentally mutilated” and were suffering from “wounds of the nervous system” (Montessori, 1917/2013, p. 39). These French and Belgian children had suffered what we would now call acute trauma as a result of this unexpected, man-made disaster (i.e., war) to which they had been exposed.

In sum, these four groups of children, the “persecuted,” “neglected,” and “rejected” children from the Roman psychiatric hospital (Montessori, 2008, p. 263); the “tearful, frightened children” of San Lorenzo (Montessori, 1936, p. 123); the “numbed, silent, absent-minded” children of Messina and Reggio Calabria (Montessori, 1936, p. 151); and the “psychologically or mentally mutilated” French and Belgian children (Montessori, 1917/2013, p. 39) shared one characteristic: all had been victims of ACEs or trauma, which Montessori recognized required a specific kind of healing and intervention.

### **How the Montessori Method Facilitated Healing From the Effects of Adversity and Trauma**

The second theme identified from the analysis relates to how the Montessori Method facilitated healing. The evidence suggests that the Montessori Method facilitated healing and recovery by (a) calming and regulating the children, (b) reorganizing the disorganized brain, (c) preventing mental strain through the use of muscle memory, and (d) promoting the currently recognized key principles of TIP: safety, collaboration, choice, and empowerment. The next paragraphs elaborate on these points.

#### ***Activities That Calmed and Regulated the Children***

Many eyewitnesses visiting the Montessori schools between 1907 and 1917, in which the last three of the four groups of trauma-impacted children described above were accommodated, noted that the children spent considerable time each day engaged in Practical Life, Sensorial, and cultural exercises that appeared to calm them. The Practical Life exercises involved either gross motor activities (e.g., sweeping courtyards, digging and weeding gardens, transporting soil back and forth in wheelbarrows, feeding and grooming animals) or fine motor activities (e.g., fastening and unfastening button, buckle, and lacing frames; folding and unfolding cloths; scrubbing tabletops; laying out mats and cutlery on tables for dining), as well as other practical and overtly meaningful exercises that required repetitive, rhythmic movements. These movements are what Montessori

termed *synthetic movement*, referring to movement that is not random but that requires that “movements of the hands are guided by the mind” (Montessori, 1936, p. 149) and that they carry out a specific purpose, with the body and the brain working in unison so that mental and motor activities are inseparable. She argued that movement without thought was chaotic, and thought without movement induced fatigue (Montessori, 1964). Standing (1957) referred to Montessori’s interpretation of synthetic movement as “movement ordered and directed by the mind to an intelligible purpose” (p. 214). The Practical Life exercises described above all require the child to use synthetic movements, and it is these synthetic movements that appear to promote repetition of the activity, which in turn brings regulation, calm, and tranquility (Bailey, 1915; Cromwell, 1916/2006; Fisher, 1912; George, 1912; Montessori, 1936).

Another feature of the Practical Life exercises relates to what we now call mindfulness. *Mindfulness* has been described as “a quality of focused attention on the present moment accompanied by a non-judgemental stance” (Lillard, 2011, p. 2). George and Fisher described this quality of focused attention in two particular Practical Life exercises that were initially developed to test the children’s hearing and develop their equilibrium, respectively. For example, the first of these—the daily Silence Game—involved the children silently tiptoeing to the teacher when their name was whispered; George (1912) commented on the calming effect of this activity: “The little bodies relax themselves softly, the breath comes evenly, and each child with his whole being settles himself to enjoy the silence. . . . The clock ticks; soft sounds come in from the cloister. . . . as the silence grows” (p. 29). Fisher (1912) remarked on the children’s “trance-like immobility” (p. 45) during the game and the “expression of utter peace” (p. 45) on the children’s faces, stating that they “emerge from it sweeter, more obedient, calmed and gentler” (p. 47). In the second activity, Walking on the Line, the children focus their mind on balancing as they carefully walk on a large oval chalk line on the floor, sometimes holding a bell they try not to ring. According to one reporter (Tozier, 1911), the concentration and integration of mind and body required by the Silence Game “calmed all excessive excitability and restored placidity and tranquility. Sometimes [the children] ask for it twice in the day” (p. 15). These exercises seemed to represent mindful activities, producing a state of calm and appearing instrumental in promoting the children’s recovery. This emergence of a state of calm

after the practice of these two activities is consistent with contemporary research on trauma and highlights the important role of mindfulness for trauma survivors in facilitating the process of recognizing the ebb and flow of emotions and physical sensations, thereby illustrating the importance of emotional regulation (Alexander, 2019; Jennings, 2019).

A further feature of the Practical Life activities that helped regulate the children was the fact that many of these activities, which the children were free to engage in spontaneously, frequently took place outdoors, which “at once promoted their development and their happiness,” according to one eyewitness (White, 1914, p. 18). In addition, the children frequently ate their meals outdoors. Contemporary research suggests that outdoor activities can have therapeutic benefits for those who have been exposed to adversity or trauma because they help to normalize heart rate and blood pressure, which are often elevated by traumatic experiences (Sorrels, 2015). Other researchers have stated that the calming sounds of nature can reduce levels of the stress hormone cortisol in the body, which in turn can help reduce the stress response (Mulholland & O’Toole, 2021).

The Sensorial activities involved the use of scientifically graded and sequenced objects that induced patterned, repetitive, rhythmic acts as the child sorts, matches, compares, contrasts, classifies, and categorizes objects. The children were free to repeat these activities as many times as they felt the need to. For example, the Cylinder Block exercise, which involves inserting cylinders of varying sequential dimensions into a block of wood, seemed to induce repetition. Montessori herself described how, at the beginning of her experimental work in San Lorenzo, she witnessed a child in deep concentration repeating this exercise 42 times (Montessori, 1936). When the child had finally finished, she smiled and looked very contented. Montessori (1936) remarked that the child’s concentration “was accompanied by a rhythmic movement of the hands, evoked by an accurately made scientific graduated object” (p. 127). She asked the teachers not to prevent but to facilitate this repetition by not interrupting the child (Montessori, 1964). Likewise, eyewitnesses who visited the early Montessori schools commented on how the children frequently repeated the Sensorial activities over and over again (Fisher, 1912; Tozier, 1911), and when they finally stopped, they displayed a notable calmness and tranquility.

Children also frequently engaged in cultural activities, such as dance, music, movement, art, and sculpting, which involved repetitive, rhythmic movements. Eyewitnesses noted that these kinds of cultural activities calmed and regulated the children by the use of rhythm. Bailey (1915), in particular, described some of these activities in which the children “keep time to rhythmic music,” (p. 26) such as marching to a piano tune, sometimes slowly, sometimes quickly, “over and over again” (p. 22). She referred to other exercises “in which the little ones sing in time to the rhythmic movement of their feet” (p. 25) and said that these were all “rhythmic activities carried out upon a line” (p. 24). Artwork, such as clay modeling and drawing, were also observed by eyewitnesses to calm the children through the use of repetitive, rhythmic actions (Cromwell, 1916/2006).

Notably in this context, contemporary research from the field of neuroscience has demonstrated how neural dysregulation occurs in the aftermath of trauma, often leaving children feeling anxious, impulsive, and emotionally unstable (Perry, 2009). Research also shows how such dysregulation can be brought back into equilibrium by engagement in activities that are rhythmic and repetitive and that ultimately reduce anxiety and other “trauma-related symptoms” (Perry, 2009, p. 243). Therefore, it is arguable that frequent engagement in these repetitive, rhythmic activities likely played a major role in the healing or recovery of these children.

### ***Activities That Organized the Disorganized Brain***

Media reports also alluded to the tranquility the Sensorial activities brought to the children, and eyewitnesses pondered the extent to which this tranquility was caused by the Sensorial materials’ ability to encourage clarity of thinking and eliminate confusion (Tozier, 1911). For instance, one eyewitness who had observed children engaged in these Sensorial exercises wrote, “Nervousness gives way to tranquility. The happy tranquility to which the children come after a few weeks of independent work with the sense-training exercises is perhaps the most noticeable feature” (George, 1912, p. 26). Cromwell also conveyed to Montessori her opinion that working with these materials provided “a veritable cure” of all the children’s ills (Montessori, 1917/2013, p. 37). Other observers suggested that the Montessori Sensorial materials were hugely beneficial to the children because they were meticulously designed to enable them

to focus their attention on a single task and element such as color, shape, or weight, thereby eliminating unnecessary distraction and fostering a sense of clarity and calm upon task completion (Fisher, 1912).

As noted above, contemporary research shows that neural dysregulation can often occur after exposure to trauma, leaving the child feeling chaotic and subject to constant confusion because of the intrusion of sudden and unsolicited fragmentary memories that mix up past and present experiences (Sorrels, 2015). Overall, it seemed that the Montessori Sensorial activities helped to reorganize the disorganized brain (caused by trauma) through their emphasis on the meticulous sorting, comparing, contrasting, and categorizing of objects (Phillips & Phillips, 2016). This engagement in repetitive activity with scientifically designed materials, which incorporated gradations and sequencing into their construction, arguably played an important role in the children's recovery; all of these activities are now known to have a regulatory function and to facilitate healing via what neuroscientist Bruce Perry called "patterned, repetitive, neural input to the brainstem" (Perry, 2009, p. 243).

### ***The Prevention of Mental Strain by the Use of Muscle Memory***

Eyewitnesses noted that the Montessori Method, by its use of *muscle memory* (i.e., a type of memory that involves committing a specific motor task into memory through repetition), avoided exposing the children to mental strain. Specifically, media reports (e.g., Tozier, 1911) alluded to how the children in Montessori's early schools learned to feel sounds and numerals as the teacher guided their fingers over Sandpaper Letters and Numbers so that they could develop a muscle memory of their shapes. Likewise, a range of objects was used to teach mathematical principles, including, for example, long rods that required the children to stretch out their arms to hold the longest rod. The basic premise underlying these approaches was that they helped the child embody both language and mathematical concepts through the use of muscle memory, which was thought to reduce mental strain (Tozier, 1911) and in turn help with recovery. Stevens (1912) claimed that Montessori, "with a physician's knowledge of a human being and a teacher's insight into child life... shows us how to protect the nervous system from strain" (p. 81). Another observer wrote, "The most conspicuous of Maria Montessori's triumphs is that of teaching quite young

children, without putting the smallest strain on their faculties, first to write and then to read," (Tozier, 1911, p. 6); she added that Montessori "goes personally into the classes to show her teachers how to handle the children so that their nerves may be kept calm and their brains left un-taxed" (Tozier, 1911, p. 132). Some eyewitnesses were aware of Montessori's understanding of the neurological implications of her methods. One of them (Stevens, 1912) wrote that Montessori "realises the plasticity of the nervous system and the importance of building into its tissues by developing muscle memory, sensory associations, habitual reactions" (p. 81). Stevens appeared to be using the word *plasticity* as we would today, to denote the quality of being easily shaped or molded. In summary, it seemed that these kinds of activities, based on muscle memory and the embodiment of concepts, helped protect the brain from becoming overtaxed. Contemporary authors have noted that children who have suffered adversity and trauma usually live in a constant state of alertness because they are continually scanning the environment to try to protect themselves and possibly others from danger (Treisman, 2017). This state can leave the brain overtaxed and stressed, so any expectation or requirement to absorb academic content may place an intolerable strain upon children; absorbing academic content via muscle memory clearly avoided strain, as evidenced by the fact that the children voluntarily kept repeating the exercises (Fisher, 1912; Tozier, 1911).

### ***The Promotion of the Key Principles of Trauma-Informed Practice***

A further factor identified as important to Montessori's apparent success in providing a healing environment was her promotion of what we now know to be key principles of TIP: safety, collaboration, empowerment, and choice (Fallot & Harris, 2009).

**Safety.** Supporting children to feel safe is an essential principle of TIP (Fallot & Harris, 2009). Our analysis revealed that physical and emotional safety were ensured in Montessori's schools by several practices: the promotion of positive relational interactions, the absence of rewards and punishments, the use of self-correcting materials, and the facility for individual activity. Let us elaborate.

The promotion of positive, relational interactions in the schools helped reduce fear in the children and promoted a feeling of safety. Referring to the children from the Roman psychiatric hospitals or "asylums," Montessori wrote:



*When these children from the streets and from the asylums entered my school they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first time they were made to feel that they were wanted and desired.* (Montessori, 2008, p. 264).

Early eyewitnesses described the children's relationships with their teachers as warm, affectionate, and respectful (Bailey, 1915; Cromwell, 1916/2006; Fisher, 1912; George, 1912; Montessori, 2008; Tozier, 1911). One eyewitness (Bailey, 1915) described how the directress, when responding to a little boy's state of withdrawal (the child in question had lost both his parents in the Messina and Reggio Calabria earthquake), would stop beside the boy's chair and "hold his hand, kindly for a minute in hers, or just bend over him, smiling straight down into his face" (p. 38). She would then repeat the words, "No one will hurt this little man of ours. He loves us and we love him" (p. 38). She comforted the child repeatedly with loving words "until one day her patience reaped the prize of Bruno's [the boy's] answering smile and she felt his two hungry little arms clasping her" (p. 38). Montessori instructed her teachers to always be mindful of a child's possible exposure to traumatic events. She told them to consider the child:

*Has the child had any frights, or other kinds of shock?... If the child is difficult or capricious, we seek for possible causes of this in the life he has led hitherto.... If we know what upsets have occurred at each period of the child's life, we can estimate their gravity and probable response to treatment.* (Montessori, 1967, p. 196)

Montessori was effectively instructing her teachers to ask themselves not "What is wrong with this child?" but rather to consider the question "What has happened to this child?" just as recommended in recent trauma literature (Perry & Winfrey, 2021); in this respect, too, she was considerably ahead of her time. Many eyewitnesses, as well as Montessori herself, observed the absence of aggressive behavior or bullying among the children (Fisher, 1912; George, 1912; Montessori, 1964; White, 1914), as well as the children's genuine concern for and helpfulness toward each other, which featured prominently in many reports (Bailey, 1915; Fisher 1912; George, 1912; Montessori, 1964; Tozier, 1911; White, 1914). For example, White wrote that "very little reproving was done. Disputes went on in the playground, but for the most part no one interfered, and it ended....

The atmosphere was one of tranquility, love and trust" (White, 1914, p. 52). Current research points toward the centrality of attuned, responsive relationships in the healing process (Cherry, 2021; Maté, 2019; Treisman, 2017), which suggests that the promotion of positive relational interactions as part of the overall Montessori approach played a key role in promoting the recovery of these children.

The absence of rewards and punishments would have enhanced the children's feeling of safety. Media reports announced, "Rewards and punishments are rigorously banished from the Houses of Childhood" (Tozier, 1911, p. 10). Eyewitnesses noted that this removal of rewards and punishments helped reduce the children's anxiety and made them feel safe (especially those who had been exposed to physical abuse), thereby preventing retraumatization (Bailey, 1915; Tozier, 1911). Moreover, regarding rewards, recent research suggests that rewards can be harmful in that they may lead to feelings of being manipulated or controlled, and children who have been exposed to trauma have often been manipulated and controlled, frequently by the very people who were supposed to care for them (Treisman, 2017). Thus, rewards run the risk of retraumatization, which, according to much contemporary research, is to be avoided at all costs (Alexander, 2019; Jennings, 2019). This finding suggests that Montessori's removal of rewards and punishments may have had considerable merit and contributed positively to the children's sense of safety and their overall healing.

The provision of "self-corrective" materials (Fisher, 1912, p. 73)—that is, materials that indicate error, allowing the user to repeat the activity until the error is corrected—most likely provided the children with a feeling of safety because children who have experienced abuse have found that asking for help frequently leads to humiliating criticism or ridicule (Sorrels, 2015). Furthermore, self-correcting exercises can arguably help build resilience because of their requirement that users repeatedly correct their own mistakes. This necessity to correct one's mistakes may lead to a kind of mild adaptive stress, or what neuroscientist Bruce Perry called "controllable, predictable stress," which ultimately "helps build resilience" (Perry & Winfrey, 2021, p. 194). The continuous building of resilience, coupled with the experience of successful mastery of activities, leads to the development of autonomy and self-esteem, both of which are vital to trauma recovery.

The provision of opportunities for individual activity ensured a sense of physical safety. Many eyewitnesses indicated that, although group activities such as singing or dancing took place daily, individual activity was frequently chosen by the children themselves, often for protracted periods of time (Fisher, 1912; White, 1914). The children designated their own personal space by spreading a mat on the floor, on which others were required not to walk. This practice enhanced their feeling of safety. Children who have experienced adversity or trauma often feel a strong need for solitude to process their emotions without the added stress of having to engage with others (Perry & Winfrey, 2021). In this respect, individual activity provided the children with a safe space in which to process their emotions.

**Collaboration.** Research also shows that collaborative activity can be healing for children who have experienced trauma because it removes the feeling of being “disconnected or separate from others,” often felt by children who have experienced adversity or trauma (Craig, 2016, p. 82). Many eyewitnesses commented on the amount of spontaneous collaboration among the children, the positive effects of the mixture of age groups, and the amount of peer-to-peer teaching that took place. For instance, George (1912) wrote, “I have never ceased to be impressed by the fact that this method made it possible for children of different ages to work together. . . . The big ones helped the little ones, and the little ones watched the big ones” (p. 26). These collaborative activities appeared to promote a strong sense of connectedness to others and, in that respect, had a therapeutic effect.

**Empowerment.** Eyewitnesses commented frequently on the remarkable level of confidence and empowerment evident in the children (Fisher, 1912; George, 1912; Tozier, 1911; White, 1914). This sense of confidence and empowerment came about through their growing independence, which was achieved through mastery of the exercises, especially the Practical Life skills. Achieving independence is very important for children who have been traumatized because it enables them to have some level of control over their lives, thereby leading to a sense of empowerment. This result can have therapeutic benefits for trauma-affected children because one of the aspects of traumatic experience is the sense of helplessness and powerlessness that often accompanies it (Treisman, 2017).

**Choice.** Many eyewitnesses observed the children’s freedom to choose their own activities and to spend as

much time as they wished engaged with them (Fisher, 1912; White, 1914). Freedom of choice is especially important for children who have been exposed to adversity or trauma because they have often previously experienced coercive control (Treisman, 2017); thus, providing choice can have an empowering and healing effect on them.

In summary, the application of these approaches resulted in indisputable psychological healing in the four groups of children described earlier, eventually contributing to the recognition by “child-specialists” (Montessori, 1936, p. 193) of Montessori schools as “Health Homes (*Case della Salute*)” (Montessori, 1966, p. 181). Moreover, when Montessori addressed the British Psychological Society in 1919, “the keynote of the meeting was the question whether the work that she is doing will eventually make the work of the ‘nerve-specialist’ superfluous” (Radice, 1920, p. 139). In addition, Hugh Crichton-Miller—the famous Scottish psychiatrist and founder of the Tavistock Clinic in London, a mental health facility, who translated Montessori’s address—was reported as saying, “When the Montessori system is established in all schools, almshouses will have to be set up for the psychoanalysts” (Radice, 1920, p. 139). It is significant that Crichton-Miller’s work centered on developing psychological treatments for shell-shocked soldiers during and after World War I.

The four groups of children exposed to the Montessori Method demonstrated psychological healing in several ways. First, the children from the “asylums,” (Montessori, 1964, p. 31), who had been excluded from schools precisely because they could not learn, subsequently learned to read and write so well that Montessori presented them for the State Examinations; they passed, much to the shock of her colleagues, who considered her achievement to be “miraculous” (Montessori, 1964, p. 38). Second, the children from San Lorenzo, who were fearful, silent, without expression, and totally lacking in social skills on the opening day of the school, were reported to have become confident, talkative, full of expression, and extremely sociable in a short period of time (Fisher, 1912; Montessori, 1964; Tozier, 1911). They also were reported to have developed both practical and precocious academic skills. Most of them started writing at the age of 4 and reading shortly afterward (Tozier, 1911). Their overall development was so remarkable that professionals from the fields of journalism, medicine, social science, education, politics,

and religion traveled to see them with their own eyes (Fisher, 1912). Third, the children who survived the Messina and Reggio Calabria earthquake—who were “numbed, silent, absent-minded,” (Montessori, 1936, p. 152), unable to eat or sleep, and suffering night terrors—reportedly became calm and happy and began to excel in both practical and academic activities such as reading and writing. Again, educators from all around the world came to see them. One such eyewitness (Marguiles, 1913) wrote:

*It is difficult to describe what now happened in America, and I believe that it is unique in the history of education. A veritable frenzy took possession of educators. Educational magazines, scientific magazines, newspapers in the North, South, East, and West brought full-page illustrated articles on the work of Montessori and her Case dei Bambini” (p. 497).*

She then remarked that, in correspondence she had with Professor Howard Warren of Princeton University, he made a statement regarding Montessori’s Method:

*My own field is psychology, and I am quite prepared to meet any attacks from that quarter. My interest in Montessori’s method arises from the fact that it is good psychology. (Marguiles, 1913, p. 502)*

Fourth, the French and Belgian refugees, who were initially in a state of stupor, incapable of understanding, and “frightened at the approach of anyone” (Montessori, 2013/2017, p. 37), were also reported to have become calm, happy, and engaged in various occupations, such as the care of plants and birds, drawing and modeling with clay, exercises with the Sensorial materials, and exercises with Sandpaper Letters and the Movable Alphabet (Cromwell, 1916/2006). Cromwell also reported that the children covered the blackboards with simple words and shortly afterward were able to write letters to their fathers in the trenches. She added that they subsequently engaged in the advanced activities of the Montessori curriculum for older children, with great success.

### **Montessori’s Proposal for Trauma-Informed Courses for Teachers and Nurses**

The third and final theme identified from the analysis relates to Montessori’s proposal to establish trauma-informed training courses for teachers and nurses to enable them to better meet the psychological needs of

traumatized children, particularly by war and natural disasters. These courses would form part of the work of an organization she hoped to establish and call the White Cross. She envisioned this as a sister organization to the Red Cross but with the specific aim of addressing the psychological needs of children who, as victims of such adversities as wars and natural disasters, were displaying the signs and symptoms of trauma. A 1916 newspaper article (“The White Cross: Montessori’s Scheme”) reported that Montessori, “whose method has a wonderful calming influence on nervous children,” (para. 1) was making plans to deliver “a theoretical and practical course in the Montessori method as especially applied to children under war conditions,” (para. 2) as part of a larger program to be delivered “with the assistance of medical specialists in nervous diseases” (para. 2). The article implied that this was to be a large-scale project that would “send out working groups to France, Belgium, Serbia, Romania, Russia, and other European countries” (para. 3). A similar article published in 1917 (“The White Cross: Care of Child Victims”) reported that the aim of the White Cross was to “restore the injured child-mind to normal activity and joy” (para. 2). Later, in 1917, while in San Diego delivering a formal address, Montessori suggested that her proposal for a trauma-informed course as part of the work of the White Cross reflected the culmination of years of active work and reflection on “the treatment of the nervous” (Montessori, 1917/2013, p. 39). She said, “My long study and work as a physician and then as an educator have led me to carefully consider the care of the nervous system” (Montessori, 1917/2013, p. 39). Mayfield (2006) also highlighted Montessori’s understanding of the importance of the child’s psychological as well as physical health:

*Montessori realized that, while providing for the physical and medical needs of children was essential during disasters, their psychological and emotional needs should also be addressed. Her recognition of the traumas of victims of the Messina earthquake, plus her observations of schools for war refugee children in France, and the devastation of World War I contributed to her call for an international organization to address these children’s needs. (p. 5)*

Mayfield (quoting Babini & Lama, 2000, p. 288) further pointed out that, as early as 1915, Montessori “expressed her wish to found an organization” to be called “una croce bianca dei bambini” [a white cross for children] (Mayfield, 2006, p. 5).

Montessori emphasized that an essential element of the White Cross organization would be the preparation and delivery by an interdisciplinary team of an intensive, free-of-charge course to prepare what she called *teacher-nurses* to rehabilitate and restore mental health to these troubled children. These White Cross workers would be a combination of nurses and teachers who would “specialize in nervous diseases and psychic or mental ills” (Montessori, 1917/2013, p. 40). She suggested that these workers “should be trained by nerve specialists, who should put to the use of these individuals all that science has discovered in order that they may care for and cure these nervously suffering children” (Montessori, 1917/2013, p. 40). Montessori (1917/2013) also emphasized that these teacher-nurses should learn “special methods of education,” (p. 40), by which she meant the Montessori Method, which she said Mary Cromwell had described as “a veritable cure” (p. 37) of the war-torn children’s ailments.

Montessori spoke authoritatively about the role of education as a response to children suffering with mental health difficulties, stating emphatically that “the treatment of nervous diseases cannot be by medicine and may properly be called education” (Montessori, 1917/2013, p. 39). She highlighted the urgent need for the coming together of experts in medicine and science to inform this intensive program for teacher-nurses. She also proposed a detailed study to fully investigate trauma and traumatic responses in these children. It appeared to her that “an organization of people preparing to go to the assistance of these children should first make a study of the child—a wide study based upon observations of the various psychological phenomena exhibited in these war children” (Montessori, 1917/2013, p. 40). However, while Montessori was tireless in her efforts to gain support for the establishment of the White Cross, her proposal was ultimately unsuccessful.

## Discussion

Currently, there is a strong interest in finding ways to incorporate trauma-informed practice into education (Alexander, 2019; Cossentino, 2016; Craig, 2016; Jennings, 2019). Our findings reported here show that the Montessori Method, as practiced in the early schools, was by its very nature both trauma informed and trauma responsive. After years of research and working intensively with vulnerable children, Montessori found a way of helping many children recover, to a greater or

lesser extent, from adversity and trauma so that they could enjoy life, thrive, and excel. Essentially, she created an environment in which children who had been harmed by adversity or trauma could benefit therapeutically. This was achieved by the children’s daily engagement in a range of daily practical, sensorial, academic, and mindfulness-based activities that involved music, movement, dance, art, and horticultural pursuits. The children were free to engage in these activities at their own pace, and all of these activities appeared to have a healing impact on their neurological, social, emotional, and cognitive well-being. This healing impact appeared to lead directly to positive learning and academic performance, as well as other aspects of overall well-being, such as improved self-esteem and independence. A central element of the Montessori Method appeared to be the freedom the children were given to select their own materials and activities and to engage with them for as long as desired. Essentially, the children controlled their own therapy and dosage. This practice is surely unique in the history of education. Another key distinguishing factor underpinning Montessori’s approach to trauma was that healing or the promotion of recovery was not seen as an add-on but instead was woven into the very fabric of the school—the materials, the approaches, the teachers, and the entire school environment. Again, considerable evidence today suggests that such whole-school approaches offer the most effective means to tackle mental health and well-being and to incorporate trauma-informed approaches within schools and other educational settings (Cole et al., 2005; Craig, 2016; Walpow et al., 2016).

All evidence suggests that Montessori’s pedagogical approach was deeply influenced by her involvement with trauma-affected children, to the point that in later life, she began to see mental health and well-being as fundamental to education (Montessori, 1917/2013). This understanding of the vital importance of mental health is very much in line with contemporary thinking and research that focuses not only on the need to support the mental health and well-being of children in schools, but also on identifying ways to incorporate TIP into education to specifically address the impact of ACEs on children’s social, emotional, and cognitive functioning (Alexander, 2019; Craig, 2016; Jennings, 2019).

Throughout her life, Montessori was relentless in advocating for schools that promote and support psychological well-being in children so that they might be better able to find joy and happiness, whatever their

circumstances. The question now is “How can we build on this?” This question will be the focus of stage two of our study, where we will incorporate the findings from this documentary analysis of archival accounts of Montessori’s early schools with the contemporary knowledge base of trauma and trauma-informed practice to design an ongoing professional-development program, initially directed at practicing teachers, both Montessori trained and non-Montessori trained. The program will be designed to facilitate an understanding of how the mind and body are affected by trauma and the different coping strategies used by children. This program will draw on the key aspects of the Montessori Method that proved effective in facilitating psychological healing in children as revealed in our historical analysis, and it will also be grounded in the key principles of TIP (i.e., safety, collaboration, empowerment, choice, trust, respect for diversity [Fallot & Harris, 2009]). This program will be delivered and tested (in service) in a number of Montessori and non-Montessori preschools, with the aim of continuing and building upon Montessori’s important early work.

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## References

- Alexander, J. (2019). *Building trauma-sensitive schools: Your guide to creating safe, supportive learning environments for all students*. Brookes.
- Babini, V. (2000). Science, feminism and education: The early work of Maria Montessori. *History Workshop Journal*, 49(1), 44–67. <https://doi.org/10.1093/hwj/2000.49.44>
- Bailey, C. S. (1915). *Montessori children*. Holt
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Bressan, D. (2012, December 28). December 28, 1908: The tsunami of Messina. *History of Geology*. <https://blogs.scientificamerican.com/history-of-geology/december-28-1908-the-tsunami-of-messina/>
- Burke Harris, N. (2019). *The deepest well: Healing the long-term effects of childhood adversity*. Marine Books.
- Cherry, L. (2021). *Conversations that make a difference for children and young people: Relationship-focused practice from the frontline*. Routledge.
- Cole, S. F., Greenwald O’Brien, J., Gadd, M. G., Ristuccia, J., Wallace, D. L., & Gregory, M. (2005). *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children, Trauma and Learning Policy Initiative. <https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>

- Cossentino, J. (2016). Montessori schools help children exposed to trauma. In L. Flores Shaw (Ed.), *The Montessori White Papers, Vol. 2* (pp. 9–16). White Paper Press.
- Craig, S. E. (2016). *Trauma sensitive schools: Learning communities transforming children's lives, K–5* (Illustrated ed.). Teachers College Press.
- Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian refugees. *AMI Communications, 2*, 11–13. (Original work published 1916)
- Fallot, R. D., & Harris, M. (2009). Creating cultures of trauma-informed care: A self-assessment and planning protocol. *Community Connections*.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)
- Fisher, D. C. (1912). *A Montessori mother*. Henry Holt & Company.
- Foschi, R. (2008). Science and culture around the Montessori's first "Children's Houses" in Rome (1907–1915). *Journal of the History of the Behavioral Sciences, 44*(3), 238–257. <https://doi.org/10.1002/jhbs.20313>
- George, A. E. (1912, July). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping, 55*(1), 24–29.
- Gutek, G., & Gutek, P. (2017). *Bringing Montessori to America: S.S. McClure, Maria Montessori, and the campaign to publicize Montessori education*. University of Alabama Press.
- Herman, J. L. (2015). *Trauma and recovery: The aftermath of violence—from domestic abuse to political terror*. Basic Books.
- Jennings, P. A. (2019). *The trauma-sensitive classroom: Building resilience with compassionate teaching*. W. W. Norton & Company.
- Kramer, R. (1976). *Maria Montessori: A biography*. Addison-Wesley.
- Lillard, A. (2011). Mindfulness practices in education: Montessori's approach. *Mindfulness, 2*, 78–85. <https://doi.org/10.1007/s12671-011-0045-6>
- Marguiles, A. R. (1913). Montessori and her Method. *American Annals of the Deaf, 58*(5), 496–502. <https://www.jstor.org/stable/44464755>
- Maté, G. (2019). *When the body says no: The cost of hidden stress*. Vermilion.
- Mayfield, M. (2006). Maria Montessori: Advocate for children. *AMI Communications, 2*, 4–9.
- Maynard, B. R., Farina, A., Dell, N. A., & Kelly, M. S. (2019). Effects of trauma-informed approaches in schools: A systematic review. *Campbell Systematic Reviews, 15*(1-2), Article e1018. <https://doi.org/10.1002/cl2.1018>
- Montessori, M. (2013). The White Cross. *AMI Journal, 1-2*, 37–41. (Original work published 1917)
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. and Trans.). Longmans.
- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books. (Original work published 1912)
- Montessori, M. (1966). *The secret of childhood* (M. J. Costelloe, Trans.). Ballantine.
- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans.). Dell. (Original work published 1949)
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). The Clío Montessori Series. Montessori-Pierson.
- Moretti, E. (2014). Beyond biological ties: Sibilla Aleramo, Maria Montessori, and the construction of social motherhood. *Italian Culture, 32*(1), 32–49. <https://doi.org/10.1179/0161462213Z.00000000022>
- Moretti, E. (2021). *The best weapon for peace: Maria Montessori, education, and children's rights*. University of Wisconsin Press.
- Mulholland, M., & O'Toole, C. (2021). When it matters most: A trauma-informed, outdoor learning programme to support children's wellbeing during COVID-19 and beyond. *Irish Educational Studies, 40*(2), 329–340. <https://doi.org/10.1080/03323315.2021.1915843>
- National Scientific Council on the Developing Child. (2020). *Connecting the brain to the rest of the body: Early childhood development and lifelong health are deeply intertwined*, Working Paper No. 15. <https://developingchild.harvard.edu/resources/connecting-the-brain-to-the-rest-of-the-body-early-childhood-development-and-lifelong-health-are-deeply-intertwined/>

- Overstreet, S., & Chafouleas, S. M. (2016). Trauma-informed schools: Introduction to the special issue. *School Mental Health*, 8, 1–6. <https://doi.org/10.1007/s12310-016-9184-1>
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–245. <https://doi.org/10.1080/15325020903004350>
- Perry, B. D., Pollard, R. A., Blakley, Y. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and use-dependent development of the brain: How states become traits. *Infant Mental Health Journal*, 16(4), 271–291. [https://doi.org/10.1002/1097-0355\(199524\)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B](https://doi.org/10.1002/1097-0355(199524)16:4<271::AID-IMHJ2280160404>3.0.CO;2-B)
- Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook—what traumatized children can teach us about loss, love, and healing*. Basic Books.
- Perry, B. D., & Winfrey, O. (2021). *What happened to you? Conversations on trauma, resilience, and healing*. Pan Macmillan.
- Phillips, S., & Phillips, B. (2016). *Healing early childhood trauma: The Montessori way*. CreateSpace Independent Publishing.
- Pino, N. A., Piatanesi, A., Valensisi, G., Boschi, E. (2008). The 28 December 1908, Messina Straits earthquake ( $M_w$  7.1): A great earthquake through a century of seismology. *Istituto Nazionale di Geofisica e Vulcanologia*. <https://pubs.geoscienceworld.org/ssa/srl/article-abstract/80/2/243/143519/The-28-December-1908-Messina-Straits-Earthquake-MW>
- Povell, P. (2010). *Montessori comes to America: The leadership of Maria Montessori and Nancy McCormick Rambusch*. University Press of America.
- Radice, S. (1920). *The new children: Talks with Dr. Maria Montessori*. Frederick A. Stokes Company.
- Scocchera, A. (2013). Montessori, the White Cross, and Prof. Ferrari. *AMI Journal*, 1-2, 48–50. (Original work published 2002)
- Sorrels, B. (2015). *Reaching and teaching children exposed to trauma*. Gryphon House.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, 40, 77–82.
- Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. SAMHSA's Trauma and Justice Strategic Initiative. [https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf)
- The White Cross: Care of child victims of the war. (1917, September 24). *The Times of London*.
- The White Cross: Montessori's scheme for healing the wounded minds of child war victims. (1916, September 18). *London Daily News*.
- Thomas, M. S., Crosby, S., & Vanderhaar, J. (2019). Trauma-informed practices in schools across two decades: An interdisciplinary review of research. *Review of Research in Education*, 43(1), 422–452. <https://doi.org/10.3102/0091732X18821123>
- Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori. *McClure's Magazine*, 37(1), 3–19.
- Trabalzini, P. (2011). Maria Montessori through the seasons of the “Method.” *The NAMTA Journal*, 36(2).
- Trabalzini, P. (2013). Nobody left behind: Montessori's work in defence of children as victims of war. *AMI Journal*, 1-2, 42–45.
- Treisman, K. (2017). *Working with relational and developmental trauma in children and adolescents*. Routledge.
- van der Kolk, B. (2014). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Penguin.
- White, J. (1914). *Montessori schools: As seen in the early summer of 1913*. H. Milford.
- Wolpow, R., Johnson, M. M., Hertel, R., & Kincaid, S. O. (2016). *The heart of learning and teaching: Compassion, resiliency, and academic success*. <https://www.k12.wa.us/sites/default/files/public/compassionateschools/pubdocs/theheartoflearningandteaching.pdf>





Revised regulate relate and reason article for JCAT 22/March/2024

**Title:**

“Does the Montessori Approach to Healing Trauma-Affected Children Align with the  
“Regulate, Relate, and Reason” Phase of the NME? A thematic Analysis.

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**Title** “Does the Montessori Approach to Healing Trauma-Affected Children Align with the “Regulate, Relate, and Reason” Phase of the NME? A thematic Analysis.

### **Abstract**

**Purpose** Given the pervasiveness of childhood trauma, there is a move to create models to support trauma-affected children in schools. The *Regulate, Relate and Reason* (3R’s) phase of the Neurosequential Model in Education (NME) is an example. However, historical models such as Montessori, have largely been ignored. The aim of this study was to compare the 3R’s of the NME with the Montessori model, (which historically was reputed to be effective in healing trauma-affected children) and examine whether Montessori’s model aligns with the neuroscientific principles and practices undergirding the 3R’s of the NME.

**Methods** Braun & Clarke’s reflexive thematic analysis was used.

**Results** The three themes identified were: - how Montessori (a) intentionally incorporated activities into the curriculum that provided repetitive neural input to the brainstem thus helping children to regulate; (b) intentionally created a rich relational environment (a non-traditional teacher, mixed age groups and peer teaching); and (c) explained that children are neurobiologically unable, rather than unwilling, to use reason when they are distressed.

**Conclusion** This paper suggests that the century year old Montessori model aligns closely with the neuroscientific principles undergirding the NME (3Rs), and that evidence of this alignment could be empowering for the thousands of contemporary Montessori educators globally (who are increasingly facing the task of supporting trauma-affected children), because it will provide them with further scientific backing for the uniqueness of the Montessori model and may enhance their professional practice and confidence giving them a ‘head-start’ in relation to their ability to support trauma-affected children.

**Keywords** Neurosequential Model in Education . Montessori Method . Sequence of Engagement . Regulate, Relate, Reason . Trauma-informed Practice

## Introduction

The purpose of this study was to (a) examine whether or not the century year old Montessori educational model (Montessori, 1912/1964) aligns with the neuroscientific principles and practices underlying the “Sequence of Engagement - *Regulate, Relate and Reason*” (3Rs) phase of the NME and (b) to argue that evidence of such an alignment, could be beneficial and empowering for the thousands of Montessori educators globally who are increasingly facing the task of supporting trauma-affected children. Firstly, such evidence will enhance their interdisciplinary knowledge about the neurobiological implications of trauma so that they understand why repetitive activities work so effectively with trauma-affected children and help them to regulate. Secondly, it may improve their practice by giving them a greater understanding of relational neurobiology and why positive relationships are healing for trauma-affected children. Thirdly, it may improve their understanding of children’s behaviours by explaining the neurobiological science behind the fact that very distressed children cannot reason or engage rationally with either adults or peers and need to become regulated before they can reason, or access certain brain functions such as memory and executive functions that are mediated by the cortex and are vital for learning (Perry, 1999). Fourthly, it may boost their confidence in relation to supporting trauma-affected children because evidence that the Montessori model embodies a framework very similar to the (3Rs) of the NME, would arguably make it likely that Montessori schools would have a ‘head-start’ in relation to their capacity to support trauma-affected children.

Childhood adversity and trauma are prevalent and found in all socio-economic groups (Felitti et al., 1998). Research shows that they can have a detrimental impact on children’s mental and physical wellbeing as well as their capacity to learn, relate to others, and function at home and in school (Craig, 2016). *Childhood adversity* includes exposure to neglect, abuse,

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and other negative experiences such as poverty, homelessness, discrimination, and racism (Felitti, et al., 1998; Merskey et al., 2017) and *childhood trauma* refers to exposure to either single or multiple overwhelmingly stressful experiences that can leave children psychologically and biologically damaged (Burke Harris, 2019; Perry & Szalavitz, 2017; van der Kolk, 2014). Research also shows that exposure to trauma is pervasive with up to two thirds of children exposed to a traumatic event before the age of 16 (National Child Traumatic Stress Network, 2020). Such exposure has been shown to lead to problematic emotional, social, and cognitive functioning in children with attendant behavioural issues in classrooms (Craig, 2016). Given the pervasiveness of trauma, and its negative impact on children, there has been a move among trauma experts to create models to help teachers to cope with trauma-affected children in schools (Perry & Graner, 2018). However, despite the fact that trauma “has shadowed humankind since our earliest days” (McSherry, 2021, p.1), there has been a failure among trauma researchers to examine historical approaches to healing trauma-affected children, thus leaving a gap in our knowledge about the effectiveness (or not) of such approaches. One of the aims of this paper is to fill that gap by examining the century year old Montessori approach to healing trauma-affected children and its recorded effectiveness or ineffectiveness; and exploring whether or not this approach aligns with modern approaches, specifically the *Regulate, Relate and Reason* phase of the Neurosequential Model in Education (NME).

### **The “Sequence of Engagement -*Regulate, Relate and Reason*” phase of the NME.**

The NME is a model developed by Dr. Bruce Perry, (the world-renowned child and adolescent psychiatrist, developmental neurobiologist, and senior fellow of the Child Trauma Academy), to help teachers to cope with trauma-affected children in schools (Perry & Graner, 2018). The NME is a non-therapeutic adaption of the Neurosequential Model of Therapeutics (NMT) also

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developed by Perry (Perry, 2006; Perry, 2009; Perry & Hambrick, 2008). The NME draws upon the NMT which Perry defines as “a developmentally sensitive neurobiologically informed approach to clinical work” (Perry & Hambrick, 2008, p. 39). The NME is Perry’s recommended approach for teachers trying to cope with the needs of children who have been affected by childhood trauma (Perry & Graner, 2018). The aim of the NME is not to ask teachers to become therapists, neuroscientists, or psychologists, but rather to educate school staff about the sequential nature of brain development and the impact of developmental trauma, and then guide teachers in how to apply that knowledge in their work with children ([www.neurosequential.com](http://www.neurosequential.com)). The NME principles apply to all children but are especially beneficial to children who have been affected by childhood adversity or trauma. The NME can guide teachers in developing strategies to reduce difficult behaviours in such children and increase their capacity to engage successfully in developmentally appropriate educational activities (Perry & Graner, 2018).

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The “Sequence of Engagement - *Regulate, Relate and Reason* is based on neuroscientific principles (Perry, & Graner, 2018). It recognizes that when the stress response is activated as a result of exposure to trauma, or re-activated because of a trauma trigger, a child becomes dis-regulated, causing the temporary “shut-down” of certain cortical areas in the brain (Perry & Graner, 2018) and the fundamental need of the child is to get back into a state of homeostasis or internal balance/stability. Perry explains that this is best achieved through engagement in what he calls “patterned, repetitive, somatosensory activities” such as singing, dancing, walking, running, breathing and other rhythmic activities (Perry, 2009, p. 252). Following the use of rhythmic activities to regulate and calm the child the next step in the sequence of engagement is to “relate”. Dr Perry and colleagues have documented the crucial role of “positive relational interactions” in the healing process for children who have been affected by trauma (Ludy-Dobson & Perry, 2010, p. 27), and explained that “The more healthy

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relationships a child has, the more likely he will be to recover from trauma and thrive” (Perry & Szalavitz, 2017, p. 258). For a teacher in a school situation, “relate” can simply take the form of (a) using a warm, friendly tone of voice when talking to children, (b) greeting children with a smile or a high five on arrival and throughout the day, and (c) using non-threatening body language such as getting down low when talking to young children so as not to tower over them. Relate always involves having an emotionally attuned adult, (someone who recognises, understands, and engages with another’s emotional state) available to the child. Following the use of rhythmic activities to regulate and calm the child, and positive, relational interactions to relate to the child, the next step in the sequence of engagement is “reason”, ie cortical engagement. Perry’s research shows us clearly why cortical engagement, for example answering questions such as “why did you do that?” cannot happen until the first two steps in the sequence of engagement happen i.e., firstly the child needs to be in a state of calm and secondly, they need to have the opportunity to relate to an emotionally attuned adult, who is also regulated. At this point, cortical engagement can happen, and it often takes the form of a dialogue between the now calm (regulated) child, who has started to respond (relate) to a compassionate, non-judgmental, emotionally attuned adult, and can now talk about the issues that are upsetting them (reason).

### 44 **The Neuroscience Behind Perry’s 3R Model and the Principle of Specificity**

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Perry explains that in children who have been exposed to trauma which was significantly overwhelming for them “there will be a high likelihood of poor organisation and functioning in lower parts of the brain” especially in the brainstem and diencephalon (MacKinnon, 2012, p. 213). He points out that one of the most recognised effects of exposure to trauma is to “alter the functioning of the brain’s stress-response systems”, which emanate from the brainstem and diencephalon” (MacKinnon, 2012, p. 213/214). Despite this alteration, he explains that the

1 human brain has the capacity to be altered by the property known as *neuroplasticity*, but he  
2 adds that “*a key principle of neuroplasticity is specificity*” (Perry & Ablon, 2019, p. 21). He  
3 explains the principle of “*specificity*” as the need to target specific neural networks if we wish  
4 to change them (p. 21). For example, in a recent publication, he states that, if you want to learn  
5 to play the piano, it is not sufficient to simply read about piano playing or watch other people  
6 playing the piano, he emphasises that you must physically put your fingers on the keys and  
7 play the piano yourself. The reason for this is that “you have to stimulate the parts of the brain  
8 involved in piano playing in order to change them” (Perry & Winfrey, 2021, p. 74).

9 He further points out that to change any neural network in the brain we need to provide  
10 “some form of patterned, repetitive activity” and he emphasises that one of the basics of neural  
11 change is activity or “*use-dependence*” (MacKinnon, 2012, p. 214). In other words, we must  
12 *repetitively* activate the neural networks we wish to modify. He states that, “Any neural  
13 network that is activated in a repetitive way will change” (MacKinnon, 2012, p. 214). He sums  
14 up this concept of ‘targeting’ specific neural networks by saying that if we want to provide re-  
15 organising, patterned, repetitive input “to reach the dysregulated or poorly organised neural  
16 networks involved in the stress response”, we need to provide “patterned, repetitive rhythmic  
17 somatosensory activity” (MacKinnon, 2012, p. 213/214).

### 18 **The Concept of ‘Targeting’ Specific Neural Networks.**

19 The idea of ‘targeting’ specific neural networks may easily be misunderstood. When asked to  
20 explain the concept of “targeting the brainstem” Perry stated that this is a frequently  
21 misunderstood aspect of his work (MacKinnon, 2012, p. 213). He reiterated that, although it is  
22 a fact that because of the interconnectedness of the brain, it could be argued that it is an  
23 oversimplification to localise function to any specific area, at the same time, “the final  
24 mediating parts of the brain for any function can be localised” (MacKinnon, 2012, p. 213). For  
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many years, Perry has argued that conventional clinical approaches to developmental problems in children (e.g. speech and language problems, learning difficulties, poor control of emotions) are often ineffective because they ignore the fact that the origin of these problems lies in disruptions to the development of brainstem and diencephalon monoamine neural networks. Consequently, he says, many clinical approaches to treating these problems are frequently ineffective because they do not target the source of the problem which is disruption to the development of “brainstem and diencephalon monoamine neural networks” (Perry, 2009, p. 243). Perry compares these ineffectual approaches to treating developmental problems in children, with the very effectual approaches to treating stroke victims. He writes: “the target of the intervention should be the innovating neural systems and not the area or the system that is the final mediator of the function/dysfunction” (Perry, 2009, p. 244). For example, he points out that, “physical exercise helps stroke victims recover speech” (Perry, 2009, p. 244). Perry also points out that even when the appropriate systems in the brain are “targeted”, clinicians “rarely provide the repetitions necessary to modify organized neural networks” (Perry, 2009, p. 244). He summarises the ineffectual approach to the treatment of many children as being due to two specific failures. Firstly, he says there is a failure to ‘target’ the correct brain areas, for example, he states that “clinical interventions often provide experiences that primarily target the innervated cortical or limbic (i.e. cognitive and relational interactions) regions in the brain and not the innervating source of the dysregulation” (Perry, 2009 p. 244). Secondly, he says that even when the correct brain areas are correctly ‘targeted’, there is still a problem because he argues that “we rarely provide the repetitions necessary to modify organized neural networks” (Perry, 2009, p. 244) so there is an insufficient number of ‘repetitions’ to modify existing neural networks making it unlikely that neural systems will change, because neural systems can only be modified by repetitive activation. To put it simply, Perry’s argument is this: if we want to effect changes in the brain, we must specifically ‘target’ the neural networks



we wish to modify and supply enough ‘repetitions’ to effect neural change. This paper aims to demonstrate that historically, Montessori did exactly this.

### **The Montessori Model**

Montessori education is “the largest alternative pedagogy in the world” (Debs, 2023, p. 283), appealing to poor, middle-class and wealthy families alike. It also appeals to the diverse belief systems of “Christians, Jews, Muslims, Hindus, and Buddhists” (p. 283). In addition, research shows that in an age when school choice is available in both the private and public sectors, interest in Montessori education is growing (Debs, 2019). The Montessori Method began in Rome, Italy. Its founder, Maria Montessori (1870-1952) was one of Italy’s first female psychiatrists with a particular interest in child mental health (Babini & Lama, 2000; De Stefano, 2022; Kramer, 1976; Standing, 1957). Graduating from the University of Rome in 1896, she immediately joined the staff of the Clinica Psyciatica, (Psychiatric Clinic) as a voluntary assistant doctor. Her early work involved her, first of all, in the care of children who were mentally challenged (Guttek & Guttek, 2017; Kramer, 1976) and later in the care of children who had been exposed to significant adversity and trauma (Phillips et al., 2022). In late 1906, as a consequence of her extremely successful experimental work with mentally challenged children, she was invited to direct the educational aspect of a potentially large social housing project in the impoverished district of San Lorenzo, in Rome (Foschi, 2008). This work developed into what very quickly became known as “The Montessori Method” (Montessori, 1912/1964). This paper postulates that from its inception, the Montessori Method used an approach very similar to the NME’s “regulate relate and reason” model with trauma-affected children, but that Montessori’s approach was unique in that that (a) she purposely built into her curriculum specific activities (that are now recognised as providers of neural input to the brainstem), and thus helped the children to *regulate*, (b) she purposely introduced a non-traditional type of teacher, mixed age groups, and peer teaching (in accordance with the

principles of what we now call relational neurobiology), and thus created and maintained a rich relational environment in her schools which helped trauma-affected children to *relate*, and (c) she purposely explained in her publications that dysregulated children are neurobiologically *unable* rather than *unwilling* to use reason or engage in activities which demand the use of higher level faculties when they are seriously distressed (Montessori, 1936). Consequently, she instructed her teachers not to try to reason with children when they were unreceptive to reason (Montessori, 1967) but instead, to offer regulatory activities and provide warm relational interactions (Montessori, 1936; 1967; 2008). Applying this approach, she first of all helped ‘mentally challenged’ children who had been expelled from schools because they were regarded as unteachable, to pass their State Examinations, and then, applying the same approach, witnessed a transformation in the emotional, social, and cognitive functioning of a large number of children living in an impoverished district in Rome, arousing worldwide interest in her pedagogical approach (Montessori, 2008).

### Method

The research question underpinning this study is - Does the Montessori Approach to Healing Trauma-Affected Children Align with the “Regulate, Relate, and Reason” Phase of the NME? To answer this question, firstly, an analysis of available sources on the NME was conducted. These sources comprised of articles, books, seminars, interviews, and online courses relating to the NME. Secondly, an analysis of four of Montessori’s major publications, *The Montessori Method*, 1912/1964, *The Secret of Childhood*, 1936, *The Absorbent Mind*, 1967, and *The California Lectures*, 2008, was conducted. These four publications were selected because they are generally recognised as being reliable sources of Montessori’s core concepts. In addition, publications of eyewitnesses to Montessori’s early schools who commented on (a) the use of rhythmic exercises and activities, (b) the creation of rich relational environments and (c) the biologically respectful approach to children, were included in the analysis (Bailey, 1915;

Cromwell, 1916/2006; Fisher, 1912; George, 1911). A Table of Data Sources is provided below.

(Insert Table 1 here)

These combined sources yielded a large amount of data. Braun and Clarke’s reflexive thematic analysis was used (Braun & Clarke, 2006, 2022). Thematic analysis is the process of identifying themes (patterns) within qualitative data. It is a method rather than a methodology which means it is not tied to a particular epistemological or theoretical perspective. This makes it a flexible method. It involves an iterative process consisting of six steps which are (a) familiarization (reading and re-reading the literature/data to become familiar with the content and to generate further insight into the topic), (b) generating initial codes (initial coding reduces large amounts of literature/data into small chunks of meaning in a systematic fashion), (c) searching for themes (a theme is a pattern that captures something significant or interesting about the literature/data, this step involves collating codes into potential themes and gathering all literature/data relevant to each potential theme), (d) reviewing the potential themes (here the aim is to review, modify and develop the potential themes that were identified in step three and consider whether the potential themes work in the context of the entire data set and ascertain that the data supports the themes), (e) defining and naming themes (here the aim is to identify the essence of what each theme is about and to generate clear names for each theme), (f) writing up the report, (usually in the form of a report, journal article or dissertation).

## Results

The analysis identified three themes – (all of which contain sub-themes) and all of which answer the research question by demonstrating that the Montessori approach aligns with the neuroscientific principles underlying the Regulate, Relate and Reason (3R) phase of the NME. These themes are (1) The intentional use of *regulating* activities in early Montessori schools (2) The intentional provision of *relational* richness in early Montessori schools and (3)

The biologically respectful approach to *reason* in early Montessori schools. These themes and sub-themes are now examined.

### The intentional use of *regulating* activities in early Montessori schools

The first theme identified from the analysis, relates to the intentional use of *regulating* activities in early Montessori schools. This theme has three sub-themes: (1) Rhythmic exercises and activities; (2) Patterned exercises and activities; (3) Repetitive exercises and activities.

During the decade 1907 to 1917, Montessori and her teachers (called directresses) worked with diverse groups of children who had been *psychologically harmed* by exposure to both chronic and acute experiences of adversity and trauma. Specifically, she and her teachers worked with – (1) the extremely impoverished San Lorenzo children who had grown up exposed to both physical and emotional neglect; (2) child survivors of the devastating Messina earthquake (1908) which left them orphaned and homeless); and (3) child survivors of WW1 - French and Belgian child refugees who witnessed horrendous atrocities when their land was invaded, leaving them homeless and mostly orphaned (Phillips et al., 2022). The behaviours of these children (documented by Montessori, and eyewitnesses – (Bailey, 1915; Cromwell, 1916/2006; Montessori, 1913/2013; 1936) indicated that their traumatic experiences had left them with high levels of anxiety and stress which today would be referred to as PTSD. While working with these diverse groups of children, Montessori and her teachers found that one factor that appeared to have a remarkably regulating effect on them was engagement in activities that involved patterned, repetitive, rhythmic movements.

#### *Sub-theme 1: Rhythmic exercises and activities*

Eyewitnesses commented on the regulating effect rhythmic activities had on the children. These activities included balancing exercises, practical life exercises, music,

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movement, and dance, colouring outline drawings and ‘metal insets’, and working with clay (Bailey, 1915; George, 1912; Cromwell, 1916/2006). Bailey wrote that the children became calm from physical exercises such as – “Climbing up and down a very short ladder”; “Stepping through the rungs of the ladder as it is laid upon the ground or the floor”; and “Ascending and descending a short flight of circular steps” made for the purpose (Bailey, 2015, p. 24). Montessori designed many types of balancing apparatus, which she saw as a first step towards helping the trauma-affected children she encountered in her schools (Montessori, 1912/1964). Bailey described how rhythmic musical exercises were used with the children. She wrote that the children: “keep time to rhythmic music” (p. 26) such as marching to a piano tune “over and over again” (p. 22). She said exercises were introduced “in which the little ones sing in time to the rhythmic movement of their feet” (p. 25). Other rhythmic activities that were provided to children (who in some schools such as the school on the via Guisti which was set up for survivors of the Messina earthquake were nearly all trauma-affected children) were called Montessori practical life exercises. These included activities that invited repetitious and rhythmic movements such as sweeping courtyards, raking leaves, digging soil, moving to rhythmic music, walking heel-to-toe on a chalk line, modeling with clay, working with cylinder blocks, and sequential cubes, all of which required patterned, repetitive movements (Montessori, 1936).

### ***Sub-theme 2: Patterned exercises and activities***

One early eyewitness commenting on the calm that arose in the children when they worked with the Montessori sensorial materials which all involve repeating patterns of actions, (e.g., matching two identical colour tablets by using the sense of sight, matching two identical sounds by using the sense of hearing, matching two similar fabrics by using the sense of touch, matching two similar qualities, e.g. sweet, sour, salty, etc. by using the sense of taste), stated – “Nervousness gives way to tranquility. The happy tranquility to which children come after a

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few weeks of independent work with sense-training exercises is perhaps the most notable feature” (George, 1912, p. 26). Many other Montessori exercises involve *patterned* activity (Phillips, 2022).

### ***Sub-theme 3: Repetitive exercises and activities***

Montessori wrote, “*I noted a peculiar behaviour that was common to all, and practically the rule in all they did – which I later called - “repetition of the exercise”* (Montessori, 1936, p. 127). For example, she described a child of about three years who repeated an exercise (involving putting cylinders in and out of holes in a wooden block) forty-two times (Montessori, 1936, p, 127). Crucially, Montessori noticed that following these repetitive exercises, children became calm and serene. For example, this child (when she suddenly ended the exercise after forty two rounds, showed by her facial expression that she was calm and anxiety free – “She smiled as if she were very happy” and “Her eyes shone” (Montessori, 1936, p.127). It was at this point that Montessori began to recognise the effectiveness of what Perry would later refer to as “patterned, repetitive, rhythmic activities” (Perry, 2009, p. 252) in moving a child from a high anxiety state to a calmer more cognitive state, simply because such activities are rhythmic and rhythm regulates the dysregulated brain (Perry, 2009).

This paper suggests that Montessori augmented the power of these activities to provide repetitive neural input to the brainstem by offering them to children when they were under the influence of the sensitive period for movement, which Montessori saw as being most acute between birth and 5 years and was characterized by an urge to *repeat* the same physical movements over and over, e.g. opening and closing buttons, tying and untying lace frames, filling and then emptying buckets or wheelbarrows using soil or sand (Montessori, 1936). Montessori’s and other eyewitness’s comments on the children would suggest that the repetitive activities (described above) helped to reduce anxiety in these trauma-affected

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children and brought regulation (Montessori, 1936; Bailey, 1915). We now understand from Perry’s work the science behind this - because as Perry states “interventions that provide patterned, repetitive, neural input to the brainstem... would be organising and regulating input that would likely diminish anxiety” (Perry, 2009, p. 243). It is therefore reasonable to state that Montessori’s approach (i.e. providing repetitive, rhythmic activities) aligns with the neuroscientific principle of specificity. In this case, since many of the children were trauma-affected, there was a need to target the brain stem where the dysregulation is centred (Perry, 2009, MacKinnon, 2012) The need to provide *repetitive* neural input to the brain stem was facilitated by the fact that Montessori deliberately offered these activities to children when they were going through a sensitive period for movement which is characterised by a compulsion to *repeat* exercises (Montessori,1936). Montessori claimed that “we ourselves, in our schools and by observing the life of children in their families, were the first to discover the sensitive periods of infancy, and to respond to them from the standpoint of education” (Montessori, 1936, p.35). One of the early eyewitnesses to Montessori’s early schools, Ellen Yale Stevens, the most experienced and respected authority on early childhood education at that time, appeared to understand that Montessori was attempting to use (an early understanding of) neuroplasticity to help to modify the brain functioning of the children in her care, because she stated categorically that Montessori “realises the plasticity of the nervous system and the importance of building into its tissues” (Stevens, 1912, p. 81). Although it is arguable that Montessori may not have fully understood (as neuroscientists now understand), the neuroscientific principles behind *why* repetitive, rhythmic movements calm the brain, this does not change the fact that her promotion of activities that use repetitive rhythmic actions reduced anxiety in the trauma-affected children she worked with and calmed them. In this respect, her approach aligns with the first of the 3Rs – *regulate*.

**The intentional provision of *relational richness* in early Montessori schools**

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The second theme identified from the analysis, relates to the intentional provision of *relational* richness in early Montessori schools. This theme contains three sub-themes – (a) A New Kind of Teacher, (b) Mixed Age Groups, and (c) Peer-teaching.

From the outset of her work with children, most of whom had been exposed to some level of adversity and or trauma, Montessori understood the need to make children feel physically and psychologically safe by *relating* to them with gentleness, kindness, and genuine love. Describing her approach with the first group of (partly homeless) mentally challenged and trauma-affected children she worked with, she said, “When these children from the streets and from the asylums entered my schools they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first time they were made to feel that they were wanted and desired” (Montessori, 2008, p. 264). She utilized three factors in her schools which created and maintained a rich *relational* environment, these factors were – a new kind of teacher, mixed age groups, and peer teaching.

#### ***Sub-theme: A New Kind of Teacher***

At the outset of her career in education, Montessori made it clear that she was advocating for a new type of education with a non-traditional, new type of teacher, and she stated overtly that this new type of teacher would give priority to the *relational* aspect of teaching. She stated, “what really makes a teacher is love for the human child” (Montessori, 1913, p. 34). Montessori’s early emphasis on the importance of love in any effort to aid the development and subsequent education of children, especially trauma-affected children, owes much to the profound influence on her thinking of the works of her predecessor, Dr. Eduoard Seguin (1812-1880), who influenced Montessori’s understanding of the vital importance of love and positive relationships in child development and human flourishing (Montessori, 1967). Seguin believed that “*affection*” could be taught just as anything else could be taught,



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he wrote, “To develop their sense of affection ... does not demand new instruments ... but the extension of the same action upon their feelings” (Seguin, 1866, p. 244). In other words, if you want children to *learn* how to love, you must love them first and Seguin and later Montessori believed that teachers were in a unique position to do this first, by being loving, kind and relational towards their students, and second, by integrating into the curriculum exercises that literally teach children how to relate to others and be kind and loving. Seguin and Montessori’s understanding that affection can be taught anticipates Perry’s statement that the principle of “specificity” applies to all brain mediated functions, including the capacity to love. Perry writes - “If you have never been loved, the neural networks that allow humans to love will be undeveloped ... given love, the unloved can become loving” (Perry & Winfrey, 2021, p. 74). Modern neuroscience therefore confirms Seguin’s and later Montessori’s belief that “*affection*” or positive relational interactions can be taught. In order to help children to *learn* how to relate positively to others, (which we now understand actually means developing the ‘neural networks’ that allow humans to love), Montessori devised specific activities known (now rather quaintly) as exercises of Grace and Courtesy. These exercises which were essentially ‘mini-dramas’ involving role-play (e.g., how to wait, take turns, or resolve a disagreement) were designed to promote social and emotional learning (SEL) and were effective in helping children, especially trauma-affected children to learn to relate to others. This paper suggests that Montessori augmented the power of these activities to provide repetitive neural input to the brain by offering them to children when they were under the influence of a sensitive period for the social aspects of life which Montessori saw as being most active between 2 and 6 years and was characterized by an acute attunement to how people treat each other socially, coupled with an urge to repeat words and actions that represent positive social behaviors. For example, children in this age group like to say ‘hello’, ‘bye’, ‘thank you’, and in Montessori classrooms they enjoy ‘role-playing’ and acting out the Montessori exercises or ‘mini-dramas’ referred to

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above. These exercises enable a child to *embody* kindness, respect, and love towards others. The exercises apparently (because of their repetitious nature) have the effect of developing the neural networks involved in social and emotional learning, and ultimately have the effect of helping children to learn how to have positive relational interactions with both their peers and their teachers (Phillips, 2022). Since, research shows that “positive relational interactions” are healing for trauma-affected children (Ludy-Dobson & Perry, 2010, p. 27), it is certainly likely that “positive relational interactions” (p. 27), intentionally promoted by the “new type of teacher”, through carefully devised exercises in the early Montessori classrooms would have played a major role in the healing process for the trauma-affected children that Montessori worked with in the decade 1907 to 1917. It is also arguable that these same exercises can still contribute to the promotion of “positive relational interactions” in contemporary Montessori schools.

### ***Sub-theme 2: Mixed Age Groups***

From the outset of her work with children Montessori had mixed age-groups in her classes and she was quick to observe the benefits of this arrangement from the point of view of what is now called relational neurobiology. She said “What matters is to mix the ages. Our schools show that children of different ages help one another” (Montessori, 1967, p. 226). She further stated that “To segregate by age is one of the cruelest and most inhuman things one can do” (Montessori, 1967, p. 226). She added that it is “a fundamental mistake” because it “impedes the development of the social sense” (p. 226). The mixture of ages in the early Montessori schools clearly promoted a feeling of connectedness and kinship (Montessori, 1967). Feeling connected has been shown to be healing for trauma-affected children because it helps to offset the feeling of being “disconnected or separate from others” frequently felt by children who have been exposed to trauma (Craig, 2016, p. 82). Montessori pointed out that

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the mixture of ages in some of her schools has the potential to span several years. She wrote -  
“The classroom for those of three to six is not even rigidly separated from that of the children  
from seven to nine ... Our dividing walls are only waist high partitions, and there is always  
easy access from one classroom to the next” (Montessori, 1967, p. 227). She adds that children  
are free to go in and out of these adjoining classrooms. As a consequence, children spend time  
in an environment that is more like a typical family with siblings of differing ages, different  
abilities, and preferences, all held together by a sense of belonging and kinship. This  
arrangement is, according to Montessori respectful of our biological need as human beings to  
live in communities and collaborate with others (Montessori, 1967).

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Ervin and colleagues, 2016, explain that ‘Up until the beginning of the 20<sup>th</sup> century  
American public schools were primarily one-room schoolhouses in which a single teacher  
taught all levels, but as rural agrarian society shifted to a largely urban, industrialized model,  
our schools changed as well. The model for these changes was the same factory model which  
had transformed our economy” (Ervin et al., 2016, p. 1). However, they point out that in  
Montessori schools, “this trend toward single grade education was not adopted” (Ervin et al.,  
2016, p. 1) and they elucidate the many cognitive, social, and pedagogical advantages of multi-  
age classrooms. From the point of view of creating a rich relational milieu for children,  
especially those affected by trauma, the Montessori model appears to be a unique educational  
model because it is biologically respectful of the needs of human beings in the course of  
development.

### 51 **Sub-theme 3: Peer Teaching**

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Dr. Montessori was quick to recognize the value of peer-teaching from a relational point  
of view. She wrote “a child of three will take an interest in what a five-year-old is doing, since  
it is not far removed from his own powers” (Montessori, 1967, p. 226). She describes the

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positive aspects of this for both the older and the younger child - “All the older ones become heroes and teachers, and the tinies are their admirers” (p. 226). She explains the details of how the partnership works - “These look to the former for inspiration, then go on with their work” (Montessori, 1967, p. 226). She commented on the traditional school’s lack of understanding of what we would now refer to as relational neuroscience and how their structure causes them to miss out on opportunities for social development in children. She said, “in the other kind of school, where children in the same class are all of the same age, the more intelligent could easily teach the others, but this is hardly ever allowed” (p. 226). She adds “The only thing they may do is to answer the teacher’s questions when the less intelligent cannot” (p. 226). She points out that the outcome of this practice is often a negative one – “The result is that their cleverness often provokes envy” (p. 226). By comparison, she points out that in the Montessori schools, positive and uplifting attributes begin to develop and flourish - “in our schools the five-year-old feels himself a protector of the younger one” and she adds “It is hard to believe how deep this atmosphere of protection and admiration becomes in practice” (p.227). She says that this leads to real bonding among the classmates – “The class gets to be a group cemented by affection” (p. 227). These three factors, a new kind of teacher, mixed age groups, and peer teaching, all contributed to creating rich relational environments in Montessori’s schools. In this respect, Montessori’s approach aligns with the second of the 3Rs – *relate*.

### **The Biologically Respectful Approach to *Reason* in Early Montessori Schools**

The third and final theme relates to Montessori’s understanding that children are neurobiologically unable rather than simply unwilling to ‘reason’ when they are distressed or dysregulated and it is therefore useless to try to reason with them or try to make them learn when they are in this state. **This theme contains two sub-themes – (1) Children are biologically**

unable to *reason* when they are distressed, and (2) Children can use *reason* when they have become regulated and can relate to even one emotionally attuned adult.

***Sub-theme 1: Children Are Biologically Unable to Reason When they are Distressed***

In her book, *The Secret of Childhood*, (1936), Montessori vividly describes children who because of distress show an inability to reason or have any type of cortical engagement with others. She said, “A kind of curtain comes down over the child’s mind, making him psychologically evermore deaf and blind” (Montessori, 1936, p.166). She understood that this is not a conscious response, on the child’s part, it is something he/she has no control over. She said it is “a psychic defense wholly outside the domain of the will” (p. 167). She understood that this state of mind prevents a child from being able to respond to anyone’s attempts to get through to him using logic or reasoning. She said, “it represents a subconscious impediment to the reception, and hence to the comprehension, of ideas imposed from without” (p. 166). She added “It is as though the subconscious mind were to say: you speak, but I am not listening; you repeat things, but I do not hear you” (p.167). She says that a child in this state “does not possess his mind” (p.166). In a later book, she advised that when this state of mind is present “It does not help to reason with the children” (Montessori, 1967, p. 202). These comments, written many years ago show Montessori’s biologically respectful approach to human development. Stevens, a child development expert and eyewitness to Montessori’s early schools stated, “I think she can claim to be the first one to give the world a rational theory of education based upon true biological, anthropological and sociological laws” (Stevens, 1913, p. 19). Montessori’s comments convey an understanding strikingly similar to Perry’s explanation of how the cortex “goes off-line” when a child is deeply distressed and in a state of hyper or hypo-arousal (Perry & Graner, 2018). Perry explains that when children are in a dysregulated state of mind, they cannot access their cortex to give rational consideration or

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rational answers to those trying to reason with them. The cortex is temporarily ‘shut down’  
during these times of distress therefore reasoning is not possible, until *regulate* and *relate* have  
done their job and the child has reached a state of homeostasis or internal stability (Perry,  
2009). This also means that a child in a state of dysregulation cannot learn and even the best of  
teachers cannot get to their cortex. The most serious consequence of this fact is that a child in  
a state of dysregulation “can sit in a classroom and not learn” (Perry,1999, p.10; 2002, p. 11).  
These children often are referred to as being “learning disabled” (Perry, 1999, p. 10).

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***Subtheme 2: Children Can Use Reason When They Have Become Regulated and can Relate.***

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Montessori’s first educational work was with children who were regarded as being  
uneducable (Montessori, 2008). They were expelled from their schools because they could not  
learn (Montessori, 1912/1964). Yet when Montessori began to work with them and gave them  
activities which helped them to become regulated (Montessori, 1912/1964), and provided  
continuous doses of positive, relational interactions (Montessori, 2008), these so called  
‘uneducable’ children suddenly learned to read and write and actually passed their state  
examinations, making Montessori look like a ‘wonder-worker’ (Montessori, 1912/1964;  
Tozier, 1911). It is clear that with Montessori’s provision of regulatory activities, and a rich  
relational environment, these children moved successfully through a cycle fundamentally  
similar to the NME ‘s Sequence of engagement - ‘regulate, relate and reason’ and ultimately,  
they were able to access their cortical brain, and were able to learn. The story was the same for  
the impoverished San Lorenzo children, the numbed, terrified children who survived the  
Messina earthquake and the French and Belgian child refugees, who were traumatised from  
exposure to war. Most of these children, many of whom, at first, appeared to be learning  
disabled, showed extraordinary emotional, social, and cognitive development, and even learned  
to write and then read at an extraordinary speed, when given regulatory exercises and activities

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and were related to with kindness and love (Tozier, 1911). This sudden onset of academic abilities which hitherto had appeared to be non-existent, demonstrated to Montessori that children can access their cognitive abilities when they first become regulated and second are supported in the development of positive relationships (Montessori, 1912/1964; 1936). In this respect, her approach aligns with the third of the 3Rs – *reason*.

### Discussion

This paper offers an important original contribution to knowledge in that it asks the question “Does the Montessori approach to healing trauma-affected children align with the *Regulate, Relate and Reason* phase of the NME?” and it finds, through thematic analysis, that there is a significant alignment between the two models. This is important because currently, trauma related problems in children are widespread and there is a need for the intentional creation of strategies to support trauma-affected children in schools. Recent events remind us that human beings, despite all our advances are still prey to wars, natural disasters and pandemics, and the inevitable trauma that arises from this. Maria Montessori lived through two world wars, a flu pandemic, and other turmoils. This paper shows that the original Montessori approach was from its inception, a model that recognized the realities of human life and so developed an approach that supports children to *regulate* their emotions when they are triggered by trauma or memories of past traumatic events; *relate* with emotionally attuned adults and with other children when they have calmed down; and consequently be enabled to use *reason* and use other higher level functions that are mediated by the cortex, such as memory, speech and language in order to learn while in school. The paper also shows that historically, using this approach, Montessori enabled large numbers of children who were labelled unteachable to pass their State Examinations, (Montessori, 1912/1964) and hundreds of independent visitors to her schools witnessed the emotional, social, and cognitive

1 transformation of impoverished and neglected children, as well as children traumatised by wars  
2 and natural disasters, through her approach (Bailey, 1015; Cromwell, 1916; Fisher, 1912;  
3 George, 1911). These facts are made all the more important by the evidence contained in this  
4 study showing that Montessori’s approach aligns with the neuroscientific principles  
5 undergirding the NME, especially the principle of ‘specificity’ (Perry & Ablon, 2019). This  
6 paper suggests that this evidence could be empowering for thousands of Montessori educators  
7 globally, who are increasingly facing the task of supporting trauma-affected children, because  
8 it provides further scientific backing for the uniqueness of the Montessori model and may  
9 enhance their professional practice and confidence, giving them a ‘head-start’ in relation to  
10 their ability to support trauma-affected children. Essentially, the study shows that the  
11 Montessori model embodies a framework very similar to the neurobiologically respectful NME  
12 (3Rs) framework which has been shown to be remarkably successful in helping teachers to  
13 calm, relate to and enable cognitive functioning (i.e., reason) with children have been affected  
14 by traumatic experience (Perry & Graner, 2018). This paper suggests that contemporary  
15 Montessori schools therefore already have the built-in infrastructure to provide trauma-affected  
16 children with neurobiologically-based strategies to help them. This infrastructure consists  
17 firstly of a curriculum that encourages the use of regulatory exercises and materials, freely  
18 available at all times to the children, so that the children can regulate themselves as needed.  
19 This includes offering materials and activities that provoke repetition which is so necessary to  
20 provide repetitive neural input to the brainstem in order to reduce anxiety (Perry, 2009).  
21 Secondly, this infrastructure consists of a relationally rich environment (the school itself) which  
22 provides (a) a new kind of teacher who is trained to understand the biological importance of  
23 love and positive relational interactions for human flourishing (Montessori, 1913); (b) mixed  
24 age groups, which promote a sense of kinship, family, belonging and community within which  
25 children are accepted and loved, (Montessori, 2008), which contemporary research shows is  
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1 vitally important to all children but especially to those who have been affected by trauma  
2 (Treisman, 2017), and (c) peer teaching as a normal part of the learning process. Peer teaching  
3 may help trauma-affected children to find their strengths, e.g., helping younger children with  
4 tasks. Thirdly, this infrastructure consists of a biologically respectful understanding of  
5 children’s inability rather than unwillingness to use reason when they are in a distressed state,  
6 or access certain brain functions such as memory and executive functions that are mediated by  
7 the cortex and are vital for learning (Perry, 1999) while in this state. This biologically respectful  
8 approach in Montessori means that teachers understand *why* children find it impossible, when  
9 in a state of dysregulation, to apply themselves to academic tasks and realise that such states  
10 are frequently caused by triggers of past trauma, and thus they leave children incapable of  
11 rational thoughts and unable to find sensible solutions to problems or disagreements.  
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27 The findings outlined in this paper are important firstly for theory, in that they show  
28 how the Montessori approach is aligned with the 3Rs of the NME and how Montessori  
29 (intentionally or otherwise) utilized the principle of ‘specificity’ and so provided neural input  
30 to the dysregulated brainstems of the trauma-affected children she worked with and witnessed  
31 firsthand the consequent reduction in anxiety, and stress in these children. Secondly, the  
32 findings are important for practice in that they provide contemporary Montessori schools with  
33 the knowledge that they may have a unique advantage in that they already have the  
34 infrastructure in place to apply themselves to the intentional and deliberate creation of trauma-  
35 informed practice in their schools. Thirdly, the findings are important for other researchers who  
36 may wish to test the Montessori approach to supporting trauma-affected children in  
37 contemporary Montessori schools using, for example, large scale mixed methods research and  
38 follow up assessments. Further research in this area may go a long way to improving the lives  
39 of children enduring the effects of traumatic experience which sadly, but realistically, is a fact  
40 of human life.  
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## References

- 1  
2  
3  
4 Babini, V., & Lama, L. (2000). *Una Donna Nuova: Il Femminismo scientifico di Maria*  
5  
6 *Montessori*. Milano, Italy: Franco Angeli.
- 7  
8  
9 Boyd, W. (1917). *From Locke to Montessori: A critical account of the Montessori point of*  
10  
11 *view*. Harrap & Company.
- 12  
13 Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research*  
14  
15 *in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- 16  
17  
18 Braun, V., & Clarke, V. (2022). *Thematic Analysis: A Practical Guide*. SAGE.
- 19  
20  
21 Burke Harris, N. (2019). *The deepest well: Healing the long-term effects of childhood*  
22  
23 *adversity*. Marine Books.
- 24  
25  
26 Craig, S. E. (2016). *Trauma-Sensitive Schools: Learning Communities Transforming*  
27  
28 *Children’s lives, K-5*. Teachers College Press.
- 29  
30  
31 De Stefano, C. (2022). *The Child is the Teacher*. Other Press.
- 32  
33  
34 Erwin et al., (2016). *Examining the Literature on Authentic Montessori Practices: Multi-Age*  
35  
36 *Groupings*. AMS. Research Committee White Paper.
- 37  
38  
39 Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V.,  
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6  
Gutek, G., & Gutek, P. (2017). *Bringing Montessori to America: S.S. McClure, Maria  
Montessori, and the campaign to publicize Montessori education*. University of  
Alabama Press.

7  
8  
9  
Kramer, R. (1976). *Maria Montessori: A biography*. Addison-Wesley.

10  
11  
12  
13  
14  
15  
16  
Ludy-Dobson, C., & Perry, B. (2010). The Role of Healthy Relational Interactions in  
Buffering the Impact of Childhood Trauma. In E. Gil (Ed.) *Working with Children to  
Heal Interpersonal Trauma: The Power of Play*. The Guilford Press.

17  
18  
19  
20  
21  
22  
23  
MacKinnon, L. (2012). The Neurosequential Model of Therapeutics: An Interview with  
Bruce Perry. *The Australian and New Zealand Journal of Family Therapy* 33(3), 210-  
218. <https://doi.org/10.1017/aft.2012.26>

24  
25  
26  
27  
28  
29  
30  
Mc Sherry, D. (2021). A New Vision for the Journal of Child and Adolescent Trauma.  
*Journal of Child and Adolescent Trauma*. 14:1-3 [https://doi.org/10.1007/s40653-021-  
00347-z](https://doi.org/10.1007/s40653-021-00347-z)

31  
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38  
Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the Measurement of  
Adversity. *Child maltreatment*, 22(1), 58–68.  
<https://doi.org/10.1177/1077559516679513>

39  
40  
Montessori, M. (1913). *Pedagogical Anthropology*. Frederick A. Stokes Company.

41  
42  
Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. and Trans.). Longmans.

43  
44  
Montessori, M. (1966). *The Secret of Childhood*. (M. J. Costello, Trans). Ballantine.

45  
46  
47  
48  
49  
Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books.  
(Original work published 1912)

50  
51  
52  
53  
54  
55  
Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans). Dell. (Original work  
published 1949)

56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
Montessori, M. (1975). *The Formation of Man*. (Trans. by A.M. Joosten) Kalakshetra  
Publications. (Original work published 1949).

1  
2  
3  
4  
5  
6  
Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected  
speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series.  
Montessori-Pierson.

7  
8  
9  
10  
Montessori, M. (2012). *The 1946 London Lectures by Maria Montessori*. (Dr. Annette Haines  
Ed.). Montessori-Pierson.

11  
12  
National Child Traumatic Stress Network, (2020).

13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
Perry, B. D. (2006). The Neurosequential Model of Therapeutics: Applying principles of  
neuroscience to clinical work with traumatized and maltreated children. In N.B. Webb  
(Ed.) *Working with traumatized youth in child welfare* (pp. 27 – 52). The Guilford  
Press.

24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens:  
Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss  
and Trauma, 14*(4), 240–245. <https://doi.org/10.1080/15325020903004350>  
[https://doi.org/10.1002/1097-0355\(199524\)16:4<271::AID-  
IMHJ2280160404>3.0.CO;2-B](https://doi.org/10.1002/1097-0355(199524)16:4<271::AID-<br/>IMHJ2280160404>3.0.CO;2-B)

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55  
Perry, B.D. and Steve Graner. (2018). *The Neurosequential Model in Education: Introduction  
to the NME Series: Trainer’s Guide (NME Training Guide)*. Child Trauma Academy  
Press.

56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
Perry, B. D., & Hambrick, E. P. (2008). The Neurosequential Model of Therapeutics.  
*Reclaiming Children and Youth*. Vol 17 (3).

Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories  
from a child psychiatrist’s notebook - what traumatized children can teach us about  
loss, love, and healing*. Basic books.

Perry, B.D., Ablon, J.S. (2019). CPS as a Neurodevelopmentally Sensitive and Trauma-  
Informed Approach. In: Pollastri, A., Ablon, J., Hone, M. (eds) Collaborative Problem

Solving. *Current Clinical Psychiatry*. Springer, Cham. [https://doi.org/10.1007/978-3-030-12630-8\\_2](https://doi.org/10.1007/978-3-030-12630-8_2)

Perry, B. D., & Winfrey, O. (2021). *What Happened To You? Conversations on trauma, resilience, and healing*. Pan Macmillan.

Phillips, B., O’Toole, C., McGilloyay, S., & Phillips, S. (2022). Montessori, the White Cross, and Trauma-Informed Practice: Lessons for Contemporary Education. *Journal of Montessori Research*. Vol 8, Issue (1).

Seguin, E. (1866). *Idiocy and its Treatment by the Physiological Method*. William Wood & Co.

Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.

Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure’s Magazine*, 40, 77–82.

Stevens, E. Y. (1913). *A Guide to the Montessori Method*. Frederick Stokes Company.

Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA’s concept of trauma and guidance for a trauma-informed approach*. SAMHSA’s Trauma and Justice Strategic Initiative  
[https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA\\_Trauma.pdf](https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf)

The Neurosequential Network, [www.neurosequential.com](http://www.neurosequential.com)

Tozier, J. (1911). An educational wonder-worker: The methods of Maria Montessori. *McClure’s Magazine*, 37(1), 3–19.

van der Kolk, B. (2014). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Penguin.

**Table 1** List of Data Sources

Author and Date	Title of Document	Document
Perry B.D. (2006)	The Neurosequential Model of Therapeutics: Applying principles of neuroscience to clinical work with traumatized and maltreated children. In N.B. Webb (Ed.) <i>Working with traumatized youth in child welfare</i> (pp. 27 – 52).	Book Chapter
Perry B.D. (2009)	Examining child maltreatment through a neuro development lens: Clinical applications of the Neurosequential Model of Therapeutics.	Article
Perry & Graner (2018)	<i>The Neurosequential Model in Education: Introduction to the NME Series: Trainer’s Guide</i> (NME Training Guide).	Book
Perry & Ablon (2019)	CPS as a Neurodevelopmentally Sensitive and Trauma-Informed Approach	Book Chapter
Perry & Hambrick (2008)	The Neurosequential Model of Therapeutics.	Article
Perry & Szalavitz (2017)	<i>The boy who was raised as a dog: And other...</i>	Book
Perry & Winfrey (2021)	<i>What Happened to You? ...</i>	Book
Mac Kinnon, L. (2012)	The Neurosequential Model An Interview with Bruce Perry	Article
Montessori, M. (1912)	<i>The Montessori Method.</i>	Book
Montessori, M. (1936)	<i>The Secret of Childhood</i>	Book
Montessori, M. (1967)	<i>The Absorbent Mind</i>	Book
Montessori, M. (2008)	<i>The California Lectures</i>	Book
Bailey, C. S. (1915)	Montessori Children	Book
Cromwell, M. R. (1916)	The Montessori Method Adapted to the Little French and Belgian Refugees	Pamphlet
Fisher, D. C. (1912)	A Montessori Mother	Book
George, A. E. (1912)	Dr. Maria Montessori: The Achievement and Personality of an Italian Woman whose Discovery is Revolutionizing Educational Methods	Article





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# The Montessori Method and the Neurosequential Model in Education (NME): A comparative study

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**Keywords:** *Montessori Method, Neurosequential Model in Education (NME), sensitive periods in development, neuroscience and Montessori*

**Abstract:** The Neurosequential Model in Education (NME) is described as a developmentally sensitive and biologically respectful approach to development and learning. This paper postulates that the NME shares many commonalities with the Montessori Method in that it, too, is developmentally sensitive and adheres to biologically respectful concepts. This paper compares some of the core principles and recommended practices of the NME with those in the Montessori Method and argues that they are consistent in many ways. The paper also examines Dr. Montessori's unique use of "sensitive periods" in development for educational purposes, in particular her use of the sensitive periods for movement, the social aspects of life, and the sensitive period for order respectively. It argues that in doing this, she was actively promoting an approach to human development and education that appears to correlate with what Dr. Bruce Perry calls a developmentally sensitive and biologically respectful approach to learning. The goal of this study is to show the science behind why many of Dr. Montessori's original practices worked and had such a positive effect on children. This knowledge should empower Montessori educators and give them the confidence to promote authentic Montessori practices in the knowledge that they are in line with current neuroscientific theories that have been shown to be beneficial to children.

*Is Montessori a genius? Is her book a real contribution to educational thought? Has her method something in it vital and universal? (Stevens, 1912, p. 78)*

Maria Montessori (1870–1952) could well be described as a brain scientist ahead of her time. She became a medical doctor in 1896 and specialized in psychiatric conditions in children (Babini, 2000). She

then turned her attention to education and human development (Babini & Lama, 2000; De Stefano, 2022; Kramer, 1976; Standing, 1957). In the above quotation, the book Stevens refers to is Dr. Montessori's seminal publication, which has been known as "The Montessori Method" since it was first translated into English in 1912. However, when Dr. Montessori first published this book in Italian in 1909, she gave it the title, "*Il Metodo della*

*Pedagogia Scientifica applicato all'educazione infantile nelle Case dei Bambini,*" which means in English, "The Method of Scientific Pedagogy Applied to the Education of Young Children in the Children's Houses." Historically, "Scientific Pedagogy" was what the Montessori Method was all about.

The Neurosequential Model in Education (NME) was developed by and is based on the work of the neuroscientist and child psychiatrist Dr. Bruce Perry. The NME is a non-therapeutic adaption of the Neurosequential Model of Therapeutics (NMT), also developed by Perry. The NMT, which started out as a purely clinical approach related to Perry's work, is an approach that incorporates key principles of neurodevelopment into the clinical problem-solving process. Perry describes it as "developmentally sensitive, neurobiology-guided practice" (Perry, 2009, p. 248). The NME, on the other hand, is non-therapeutic. Perry describes it as "a developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a). The NME has universal application across the entire spectrum of children but is especially beneficial to children with developmental problems. The NME is a "train the trainer" model in which teachers (often school principals) are trained in the NME and then pass that training on to other teachers in their school or district. The goal of the training is not to turn teachers into therapists, neuroscientists, or psychologists; rather, the training guides teachers in identifying the child's primary developmental problems and then aids them in developing a rehabilitative plan that helps to reduce difficult behaviors and increase the child's ability to engage successfully in developmentally appropriate educational activities.

This paper compares some of the core principles and recommended practices of the NME with those in the Montessori Method and outlines the shared features of the two models and shows how Dr. Montessori's early work anticipated many current principles in neuroscience. It also examines Dr. Montessori's unique use of "sensitive periods" in development for educational purposes (in particular, her use of the sensitive periods for movement, the social aspects of life, and order, respectively, and argues that, in utilizing the sensitive periods for educational purposes, she was actively promoting an approach to human development and education that appears to correlate with what Perry calls a "developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a).

## Method

This paper compares some of the neuroscientific principles of the NME with practices in the Montessori Method to shed more light on the science behind Dr. Montessori's success with children. To do this, the author conducted an analysis of available sources on the NME. These sources comprised of books, articles, interviews, seminars, YouTube webinars, and online courses relating to the NME. In addition, the author conducted an analysis of four of Dr. Montessori's seminal books—*The Montessori Method* (1912/1964), *The Secret of Childhood* (1936), *The Absorbent Mind* (1949/1967), and *The Formation of Man*, (1949/1975)—and her pamphlet, *The Four Planes of Education* (1971, from a lecture delivered in 1938). These five publications were selected because they are generally recognized as reliable sources of Dr. Montessori's core concepts. Additionally, an analysis of Jean Marc Gaspard Itard's (1802) book, *An Historical Account of the Discovery and Education of a Savage Man*, and Édouard Séguin's (1866) book, *Idiocy and Its Treatment by the Physiological Method*, was also conducted because Dr. Montessori repeatedly stated that her work builds on the work of Itard and Séguin. These combined sources yielded a large amount of data. Braun and Clarke's analytical model on thematic analysis was used (Braun & Clarke, 2006, 2022). Specifically, the literature was examined, coded, and categorized into themes. Subsequently, the theoretical concepts (as outlined in the theoretical framework below) shaped the final identified themes.

## Theoretical Framework

This study is centered on the concept of offering children a developmentally sensitive and biologically respectful education as expounded by Bruce Perry in his Neurosequential Model of Education. It is also centered on Dr. Montessori's own original concept of providing children with a developmentally sensitive and biologically respectful education, which includes her utilization of "sensitive periods" in human development from the standpoint of education, as expounded in her seminal publications listed above.

## Results

The analysis identified three major themes: (a) The 6 R's of the NME, (b) How the 6 R's of the NME

align with the Montessori Method, and (c) How Dr. Montessori utilized sensitive periods in development to provide children with an educational approach that anticipates what Perry calls a “developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a). We now review each theme.

### **The 6 R’s of the Neurosequential Model in Education**

The first theme identified from the analysis relates to the “6 R’s” of the NME. In an NME classroom, there is an adherence to 6 R’s. This means that the classes try to be the following:

- 1) Relational (promoting a sense of kinship and safety). NME educators are trained to build quality human relationships with their students, especially with the students who present the most challenges, because “Positive relational interactions” have been shown to promote “healthy development” in children (Ludy-Dobson & Perry, 2010, p. 27). For children who have been emotionally damaged, Perry and Szalavitz (2017) argue that “The more healthy relationships a child has, the more likely he will be to recover from trauma and thrive. Relationships are the agents of change, and the most powerful therapy is human love” (p. 258). Perry emphasizes “the primacy of human connectedness,” the power of “connectedness and belonging” (Perry & Winfrey, 2021, pp. 270, 249), and the importance of community (ThinkTVPBS, 2020c).
- 2) Rhythmic (resonant with neural patterns). NME educators are trained to utilize rhythm in their classes (e.g., walking, music and movement sessions, dancing, balancing exercises, yoga, drumming sessions, and group singing), because such activities “would be organizing and regulating input that would likely diminish anxiety, impulsivity” (Perry, 2009, p. 243).
- 3) Repetitive (having repeating patterns). NME educators are taught that the brain only changes through “patterned, repetitive activation” (Perry, 2009, p. 244). Educational content, therefore, should be offered as creatively as possible keeping this core concept of repetition in mind.
- 4) Relevant (developmentally matched to the child). NME educators are trained to be aware of the varying developmental levels of their students so they can offer content that is appropriate to the students’ level of comprehension (ThinkTVPBS, 2020e).
- 5) Rewarding (giving pleasure). NME educators are trained to keep at the forefront of their minds their

student’s need for success, knowing that the pleasure of learning something new will naturally lead to the desire to learn more (ThinkTVPBS, 2020e).

6) Respectful (of the children, their culture, and their immediate and extended families). NME educators are trained to respect the diverse cultural backgrounds of students and their families and to use these backgrounds as a springboard to learning (ThinkTVPBS, 2020a).

### **How the 6 R’s of the NME compare with the Montessori Method**

The second theme identified from the analysis of the literature relates to how the 6 R’s of the NME align with the Montessori Method. As stated above, in an NME classroom, the 6 R’s mean that the classes need to be relational, rhythmic, repetitive, relevant, rewarding, and respectful. In this regard, there is much commonality between the NME and the Montessori Method.

Firstly, an analysis of the literature selected and scrutinized for the purposes of this study shows that there is a strong commonality between the “relational” aspect of an NME classroom and the “relational” approach advocated by Dr. Montessori in her method. As early as 1897, when Dr. Montessori began to work with mentally challenged children, she realized the importance of positive, relational interactions between teachers and children. When describing her work with these children, she wrote,

*When these children from the streets and from the asylum entered my school they were greeted with hearty manifestations of welcome and with genuine cordiality. For the first time they were made to feel that they were wanted and desired.* (Montessori, 2008, p. 264)

She went on to describe how these children flourished emotionally, socially, and cognitively, even managing to pass the Italian State exams, much to the amazement of the public. Moreover, as early as 1904 in her lectures at the University of Rome (which later became the main content of Dr. Montessori’s 1913 publication *Pedagogical Anthropology*), Dr. Montessori stated, “What really makes a teacher is love for the human child” (Montessori, 1913, p. 34). She also recognized the power of love as a force for human flourishing. She wrote: “This force that we call love is the greatest energy of the universe” (Montessori, 1967, p. 290). She asks: “Why should it not always be a subject for study and analysis, so that its power can

become beneficent?” (Montessori, 1967, p. 290). She writes: “Every contribution able to bring out the latent power of love, and to throw light upon love itself, should be welcomed with avidity and considered of paramount importance” (Montessori, 1967, p. 290).

Dr. Montessori also recognized the fundamental importance of community and having a sense of belonging. In a rare Montessori article based on a lecture she delivered in Kodaikanal, India, in 1944, she stated, “In English, there is the famous sentimental expression ‘Home! Sweet home!’ For the adult, the idea of home rings with similar satisfactory notes. But where is the child to find an answer to his need? In the ‘House of Children,’ we endeavor to give to the child the relief of feeling, for once, ‘at home’” (Montessori, 2013, p. 11). In another publication, she repeatedly stated that her schools were not *houses* of children but rather *homes* for children with all the warmth, love, and sense of belonging that a good home signifies (Montessori, 1967). She made her schools into little communities where children felt they were useful, welcomed, and loved members of a social group (Montessori, 2008, p. 264), and they showed evidence in their social, emotional, and behavioral growth that they were flourishing as human beings (Montessori, 1964, 1936). These statements by Dr. Montessori (and there are many more) resonate strongly with what Perry has discovered about the healing power of love and the need for schools to be relational. Also, Perry, in agreement with Dr. Montessori, states that “the most powerful therapy is human love” (Perry & Szalavitz, 2017, p. 258).

Secondly, Montessori and Perry express similar views about the need for schools to make use of rhythmic exercises and activities. As far back as 1897, when she first worked with mentally challenged children, Dr. Montessori recognized the importance of rhythmic activities to calm the brain. Following and surpassing her predecessor Séguin, she made use of what Perry calls “patterned repetitive rhythmic activities” (Perry, 2009, p. 243). These take the form of rhythmic practical life activities (such as sweeping, scrubbing, dusting, pouring, spooning, buttoning), sensorial activities (cylinder blocks), cultural activities (movement to rhythmic music), prewriting activities (the rhythmic movements involved in the insets for design and “metal insets”), mathematical activities (the rhythmic movements involved in feeling sandpaper numbers and the patterned movements involved in matching cards and counters), and language activities (the rhythmic movements involved in feeling the shapes of sandpaper letters). Many early eyewitnesses to Montessori schools commented

at length on the rhythmic aspect of the curriculum (see Phillips et al., 2022).

Thirdly, regarding the need for schools to make use of repetition in their exercises and activities, Dr. Montessori, from early on in her work, expressed her observations about the role of repetition in children’s development and learning which are similar to ideas later emphasized in the NME. For example, in 1907, when recording her initial observations in the very first Casa dei Bambini, Dr. Montessori states that “the very first phenomenon that awoke my attention” was the young child’s natural tendency to repeat exercises and activities (Montessori, 1936, p. 126). She describes her incredulity when observing a young child repeating a cylinder block 42 times. She later observed this phenomenon in children’s other activities such as hand washing (Montessori, 1936, p. 128). She further observed that following this “repetition of the exercise...the children emerged as rested, full of life, with the look of those who have experienced some great joy” (Montessori, 1936, p. 127). From this moment on, she encouraged her teachers to allow children to repeat an exercise as many times as they wished because she recognized that repetition had psychological significance and seemed to meet an “inner need” in the child (Montessori, 1936, p. 128).

Fourthly, Montessori and Perry both argue that schools need to be relevant—that is, developmentally matched to the child. Very early on in her work in the Casa dei Bambini, Dr. Montessori recognized the necessity of giving children free choice in their selection of activities to ensure that the activities were developmentally matched to the child. She wrote: “The children had their special preferences and chose their own occupations. To enable them to do so, we later provided low, pretty cupboards in which the apparatus was placed at the disposition of the children, who could choose what corresponded to their inner needs. Thus, the *Principle of free choice* accompanied that of *Repetition of the exercise*” (Montessori, 1936, p. 129).

Fifthly, regarding the need for schools to be rewarding—that is, to give pleasure and a feeling of success producing good chemical responses in the child, Dr. Montessori and Perry share a commonality. Dr. Montessori repeatedly observed that the children, having engaged in activities of their own choice which allowed them the possibility of success, and having been allowed to repeat these activities for as long as they wished without interruption, became happy and joyful, “their faces alert and joyous” (Montessori, 1936, p. 153).

Sixthly, regarding the need for schools to be

respectful of the children, their culture, and their immediate and extended families, Dr. Montessori and Perry appear to be of the same mind. Regarding the child, Dr. Montessori wrote: “The child is truly a miraculous being, and this should be felt deeply by the educator” (Montessori, 1967, p. 121). Very early on in her work with the children in the first Casa dei Bambini in 1907, Dr. Montessori became aware of the young child’s acute sense of dignity and need for respect when she noticed how they were continuously reprimanded by adults for having “runny” noses and so decided to give them what she thought was a “humorous lesson” on how to blow one’s nose discreetly. Following the lesson, the children reacted with a burst of applause (Montessori, 1936, p. 134). Dr. Montessori stated that “afterwards, through long experience, I discovered that children have a profound feeling of personal dignity. . . . I had indeed touched these poor little children in their social dignity” (Montessori, 1936, p. 135). Dr. Montessori extended this respect to the children’s immediate and extended families by such simple things as “chatting” directly with the mothers of these children (something unheard of in her day) and instructing her teachers to have weekly meetings with the mothers so that they could discuss their children together (Montessori, 1964).

**How Dr. Montessori utilized “sensitive periods” in development to provide children with an educational approach that anticipates what Perry calls a “developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a)**

The third and final theme identified from the analysis of the literature relates to how Dr. Montessori utilized “sensitive periods” to support a developmental approach that anticipates what Perry calls a “developmentally sensitive and biologically respectful approach to learning” (ThinkTVPBS, 2020a).

The concept of sensitive periods in development was first postulated in biology with regard to animal life. However, Dr. Montessori had a deep insight into the existence and importance of sensitive periods in the development of the human being. She wrote, “Man’s mind does not spring from nothing; it is built up on the foundations laid by the child in his sensitive periods” and claimed to be the first to discover “the sensitive periods of infancy” (Montessori, 1936, pp. 55, 34). She regarded sensitive periods as protective factors designed by nature to aid the optimal development of the human being. She defined sensitive periods as (a) critical periods or blocks of time in children’s lives when nature directs

them to focus their attention on areas that are vital to their normal development at a specific point in time; (b) temporary phases which wane and ultimately fizzle out when children have been given enough time to master the area necessary for their optimal development; and (c) windows of opportunity for learning and development because, during each of the sensitive periods, children experience an intense and extraordinary interest in the area that nature directs them to focus on, which causes them to repeat an activity until they have mastered it. Regarding sensitive periods, she wrote:

*It was the Dutch scientist Hugo de Vries, who discovered the existence of sensitive periods in animal life, but we ourselves, in our schools and by observing the life of children in their families, were the first to discover the sensitive periods of infancy, and to respond to them from the standpoint of education. These periods correspond to special sensibilities to be found in creatures in process of development; they are transitory and confined to the acquisition of a determined characteristic. Once this characteristic has evolved, the corresponding sensibility disappears. (Montessori, 1936, pp. 34–35)*

Dr. Montessori identified several sensitive periods in development during the first six years of life (Montessori, 1936). She saw the importance of making use of the sensitive periods “from the standpoint of education” (Montessori, 1936, p. 34) because she believed that children would never again experience a level of interest, concentration, or devotion to a specific area that they experienced while under the influence of its corresponding sensitive period.

**Dr. Montessori’s concept of a sensitive period for movement**

Édouard Séguin (1812–1880), a French physician who developed what he called the “Physiological Method” of education, greatly influenced Dr. Montessori. She translated word for word the lengthy French volume of his work (Séguin, 1866). For Séguin, the importance of movement and physiological exercises as a means of reaching the brain was fundamental. In explicating Séguin’s understanding of the importance of movement and muscular education, one of Dr. Montessori’s contemporaries wrote,

*The brain, the organ of the mind, is a part of the nervous system, and through this system alone can the mind of the pupil be reached. And in its turn the nervous system can be reached only through the muscles and senses; so that the education of the child must begin with the training and development of his muscular and sensorial powers. (Fynne, 1924, p. 145)*

Séguin's views on the importance of movement and muscular education were in accord with best twentieth-century thought. For example, in 1904, Professor Herman Horne, the American educational philosopher, wrote:

*All appeals to the mind, educational and otherwise, must be made through the agency of the nervous system. The senses on the one hand and the muscles on the other are the two first gateways through which educational influences must proceed. The educator who would climb up into the mind by some other way is unaware of the nature of the child with whom he has to deal. The training of the senses and the doing of things well that require delicacy of muscular adjustment are the two beginnings of physical education, and only a sound physical education can support a sound mental education. (Horne, 1904, pp. 61–62)*

This paper argues that Dr. Montessori took Séguin's principles a step further when she added to them the power of the sensitive periods in development which promote "repetition of the exercise" (Montessori, 1936, p. 126). By utilizing the sensitive periods, with their inbuilt compulsion towards repetition, as an aid to the development of the body and the mind, Dr. Montessori was clearly promoting an educational approach that shares features similar to what Perry calls a "developmentally sensitive and biologically respectful approach to learning" (ThinkTVPBS, 2020a).

From her meticulous observations of young children, Dr. Montessori became convinced that, from birth to 6 years, all children experience a "Sensitive Period for Movement" (Montessori, 1936) which is most acute between birth and 5 years. She noticed that during this period, children are intensely interested in and focused on perfecting their movements; therefore, they repeat certain movements. Following these repetitive actions, they appear to become calm and "very happy" (Montessori, 1936, p. 127). To facilitate this sensitive period, Dr. Montessori designed many activities and

exercises involving small and gross motor movements. These activities and exercises feature prominently in the practical life, sensorial, and cultural areas of the Montessori curriculum. They also feature in the language and math areas of the curriculum, especially in activities that utilize procedural or muscle memory—that is, a type of memory that involves committing a specific motor task into memory through repetition; for example, children learn to feel sounds/numerals by repeatedly feeling sandpaper letters/numbers and so developing a muscle memory of their shapes. In all these activities, repetition is paramount, because, as neuroscience now shows us, "interventions that provide patterned, repetitive, neural input to the brainstem... would be organizing and regulating input that would likely diminish anxiety" (Perry, 2009, p. 243).

To onlookers who knew of Dr. Montessori's years of research, the science behind the genius was evident. One witness wrote:

*When one visits these schools the life of the children seems so normal, so natural, and their activities at first glance so undirected, that it is easy to overlook the fact that behind all this, making it possible, lie years of preparation, of scientific training, of extensive experimentation, deep and earnest thought, reverent, unprejudiced observation. Perhaps no educator has ever approached a pedagogical experiment through such broad and remarkable training. It is characteristic of Maria Montessori's peculiar genius that her gifts as a scientist, a physician and a psychologist have always been but means through which she might help more vitally the lives of those about her. (George, 1912, p. 28)*

Another eyewitness, the highly respected American Kindergarten expert Ellen Yale Stevens, wrote that Dr. Montessori "realises the plasticity of the nervous system and the importance of building into its tissues" (Stevens, 1912, p. 81). Stevens appears to be using the word plasticity as we would today—to denote the quality of being easily shaped and molded. Solange Denervaud, a neuroscientist and former Montessori educator, whose work examines the impact of the Montessori pedagogy on the neural development of the child, emphasizes the importance of neuroplasticity in childhood. Denervaud reportedly said, "brain plasticity lasts until our death. But in reality, we build our foundations during childhood" (Galitch, 2021, p. 5). By utilizing the sensitive period for movement as an educational aid, Dr. Montessori was, in

effect, utilizing the brain's capacity for neuroplasticity to the maximum.

### **Dr. Montessori's concept of a sensitive period for the social aspects of life**

Édouard Séguin believed that social and emotional learning "affection" could be taught just as the refinement of the senses was taught:

*To develop their sense of affection . . . as were developed their senses of sight, hearing, and others, does not demand new instruments, or new teachers but the extension of the same action upon their feelings. To make the child feel that he is loved, and to make him eager to love in his turn, is the end of our teaching as it has been its beginning. If we have loved our pupils, they felt it and communicated the same feeling to each other; if they have been loved, they are loving. . . . For our pupils. . . . love alone can truly socialize them; those alone who love them are their true rescuers. (Séguin, 1866, pp. 244–245)*

Dr. Montessori took Séguin's ideas about social and emotional learning and built on them. From her meticulous observations of young children, Dr. Montessori became convinced that all children (from approximately 2 to 6 years) experience a "Sensitive Period for the Social Aspects of Life" (Montessori, 1936, p. 33). During this period, children are intensely interested in and focused on how we interact with and treat other people.

This paper postulates that Dr. Montessori was (and still is) unique among educators in that she used this sensitive period in children's lives to teach them how to show qualities like kindness, respect, and empathy by having children repeatedly act out kindness, respect, and empathy. She named these activities the Exercises of Grace and Courtesy. She also utilized specific collaborative activities, especially ones that involve movement, therefore combining the power of the sensitive period for movement with this sensitive period. For example, she encouraged and facilitated collaborative activities such as the carrying of tables, chairs, or large teaching materials out to the garden or preparing long tables for communal meals (Montessori, 1936). Similarly, through the Exercises of Grace and Courtesy, children embody the qualities of love, respect, kindness, empathy, and so on. For example, by teaching children the physical action of stepping aside to allow somebody to pass or of

closing the door quietly so as not to disturb others, we are, in effect, ingraining in the child's procedural memory the know-how of showing respect and kindness to others. The implications of this are immense.

It could be argued that we are laying the bedrock for preventing bullying in childhood, adolescence, and in the workplace in adulthood. It has already been shown that Montessori schools have significantly less "ambiguous rough play" than non-Montessori schools (Lillard & Else-Quest, 2006). Moreover, early eyewitnesses frequently commented on the lack of bullying in the early Montessori schools (see Phillips et al., 2022). It is arguable that this was a direct result of the emphasis on the Exercises of Grace and Courtesy which took place daily in authentic Montessori schools and enabled children to embody respect, kindness, and empathy towards others.

This approach is very different from that used in many playschools where children are constantly admonished to "share," "play nice," etc. Although these admonitions are well intentioned, they are often ineffective. The Montessori Exercises of Grace and Courtesy differ significantly in that these exercises, being made into physical actions rather than just admonitions, become part of the child's procedural memory. When children are exposed daily to patterned, repetitive exercises that embody kindness during this sensitive period when they are most open to learning empathy, the physical learning of empathy becomes hardwired into the child's psyche; it is difficult to eradicate because procedural memories are hard to unlearn (Grigsby & Stevens, 2001). This concept is important because research on memory suggests that procedural memory actually forms a person's character; these behaviors become "who we are" (Grigsby & Stevens, 2001, p. 102).

Denervaud and colleagues make some important observations on how school systems shape children's knowledge and creative abilities, which may have bearing on the topic under discussion. They write: "Children in a Montessori pedagogy are immersed in a more enriched and diverse school environment. They explore concepts through real life activities and interactions with their peers" (Denervaud et al., 2022, p. 1). She goes on to state that: "Children, by perceiving concepts and understanding more flexibly, may be more open to others" (Denervaud et al., 2022, p. 1). Perhaps we should think of the sensitive period for the social aspects of life as a period for social and emotional development because that is essentially what it is.



### **Dr. Montessori's concept of a sensitive period for order**

*The little child's need for order is one of the most powerful incentives to dominate his early life.*  
(Montessori, 1967, p. 190)

Dr. Montessori was convinced that there was nothing “haphazard” about the development of the human mind: “If the whole universe is governed by fixed laws, is it possible that the human mind be formed haphazardly, i.e., without any law at all?” (Montessori, 1975, p. 9). She argued that “Nature gives small children an intrinsic sensibility to order” (Montessori, 1936, p. 55) as an aid to their efforts to “construct” their own brains. It is arguable that that Dr. Montessori was (and still is) unique among educators in that she recognized and utilized the power of the sensitive period for order which promotes the repetition of orderly exercises and activities to aid children in the optimal construction of their brains, because in the larger, biologically driven picture, healthy brain development is needed for the continuation of a healthy species. She aided the development of children’s sequential memory by designing curricular activities that involve order and sequencing and by laying out the prepared environment in an orderly way. The following paragraphs elaborate on these points.

Dr. Montessori’s meticulous observations of children convinced her that all children experience a “sensitive period for order” (Montessori, 1936, p. 55; 1967, p. 190). This sensitive period begins at birth but is most noticeable between 2 to 4 years, often because of the distress its infringement causes to the child. It is arguably the most important of the sensitive periods and, regrettably, the least recognized or understood by parents and teachers alike. Dr. Montessori was convinced from her observations of young children that, during the sensitive period for order, nature programs young children to focus on patterns, routines, and sequences in their daily life to help them in their brain construction. Since children construct their brains from what they find in their immediate environment, it follows that if that environment is chaotic, children’s brain development may not be optimal. On the other hand, if children’s immediate environments are well ordered and there are no other endangering factors (such as genetic predispositions to abnormal brain development or other adverse conditions), children stand an excellent chance of having optimal brain development.

Once Dr. Montessori recognized this sensitive period for order, which only exists during the first plane

of development, birth to 6 years, (Montessori, 1971), she constructed her Case dei Bambini (Children’s Houses) to cater for it by embedding order onto every aspect of the environment, both indoors and outdoors. In practice, this means that the physical layout of the prepared environments for children in this age range is meticulously orderly. For example, the materials for each curriculum area (practical life, sensorial, language, mathematics, cultural) are laid out in an orderly fashion on sets of shelves. Each set is arranged sequentially from the most basic level of difficulty to the most complex. Each child is shown from the outset how to carry the materials carefully to a mat or a table to work with them and then how to replace them on the correct shelves when he or she is finished.

Many of Dr. Montessori’s contemporaries understood the groundbreaking significance of what she was doing. The assistant editor of the London Times Educational Supplement, having had talks with Dr. Montessori over the course of several months in 1919 about her method, wrote: “This is not merely a new way of amusing children—it is the beginning of a re-organization of the human mind” (Radice, 1920, p. 11). Order and sequence are to be found everywhere in an authentic Montessori environment. More importantly, this practice of sequencing is essential for the development of sequential memory, which is a vital element of healthy brain development and is particularly necessary for the development of literacy and numeracy skills.

**Sequential Memory—What It Is and Why it is Impaired in Some Children.** Craig (1992) explains the importance of sequential memory, a type of memory which can remember visual and auditory input in sequence, in the learning process: “A child’s successful completion of many academic tasks depends on the ability to ‘bring linear order to the chaos of daily experience’” (p. 67). She explains that in the first few years of life, sequential memory is not yet developed, and the brain records events “much like a series of snapshots that capture the essence of experience but may lack a linear sequence” (p. 67). The cognitive process that crafts these “snapshots” and into a linear sequence is sequential memory. Sequential memory is clearly not something we are born with. It is something that must be developed. Craig argues that there is a crucial need for stable, predictable, ordered environments and equally stable caregiving for the successful development of sequential memory: “The transition to sequential semantic memory is most easily made in environments marked

by consistent, predictable routines and familiar, reliable caregivers” (p. 67). She emphasizes that when these conditions are not available, sequential memory does not develop properly: “In the absence of these factors, children may continue to encode new information episodically or not at all” (p. 67).

As we know, many children do not grow up in stable environments. This is particularly true of children brought up in the care system and homes where there is substance misuse or mental health issues. In these circumstances, the threats to the development of sequential memory are serious. Craig (1992) also argues that children who grow up in homes where rules can vary according to the transient inclination of the caregiver will have difficulty developing sequential memory: “Children raised in households in which rules and routines are subject to the whim of the parent may lack the consistency and predictability required to move easily into a more sequential ordering of the world” (p. 67). This impacts both children’s ability to learn and especially their struggles to learn within a school environment that relies on sequential ordering. Craig argues that many children’s difficulties in school relate to their having what she refers to as “a learning style that is unresponsive to school environments that rely on sequential ordering” (p. 68).

**How the Montessori Method Aids the Development of Sequential Memory.** The emphasis on order in authentic Montessori schools, which necessarily involves carrying out activities in a sequence, leads to the development of sequential memory. For children whose exposure to a chaotic home environment has impeded the building of sequential memory, the Montessori school could be a significant aid to their development. Every activity the child engages in—whether it is scrubbing a table, washing a window, or polishing a mirror—involves a meticulously planned sequence of steps to enable not just the completion of the activity but, in the long term, to aid the development of a healthy brain. Therefore, in an authentic Montessori school, the disadvantages a child suffers from exposure to a chaotic home environment can be compensated for, daily, by the multitude of “sequencing” opportunities made available to the child through the Montessori materials and exercises.

## Discussion

This paper offers a unique contribution to the field of Montessori research by comparing some of the core principles and recommended activities of the

Montessori Method with some of the core principles and recommended activities of the now-acclaimed NME. The author is unaware of any other study that does this. The paper also examines Dr. Montessori’s unique use of sensitive periods in development for educational purposes (in particular, her use of the sensitive periods for movement, the social aspects of life, and the sensitive period for order respectively) and argues that, in utilizing the sensitive periods for educational purposes, she was actively promoting an approach to human development that appears to anticipate what Perry calls a developmentally sensitive and biologically respectful model of education.

In many countries, there has been a move away from authentic Montessori practices, including the facilitation of sensitive periods. This, it could be argued, is resulting in poorer outcomes for children. Often, this is because of national policies relating to early years curricula. For example, many teachers feel they are under growing pressure to apply curricula that (a) take no heed of the sensitive periods in development or (b) trample over the sensitive periods in development—in particular the sensitive period for order, which is most vulnerable to being ignored by teachers and parents alike. Frequently, Montessori teachers feel that they have no choice here. A country’s early years curriculum is often designed by people who have no knowledge of Dr. Montessori’s discoveries, especially in relation to sensitive periods and the sensitive period for order in particular.

In addition, Montessori teachers often report that parents are often suspicious, or even afraid, of classrooms that look too structured or too tidy. Also, there may be a perception among parents that a structured classroom will not support a play-based curriculum, and so teachers are nervous of making their classrooms look too tidy or structured. Because of this, many teachers (some interviewed by the present author) state categorically but wistfully that they can no longer prioritize the sensitive periods, especially the sensitive period for order, when laying out their environments.

If the sensitive periods in development, and in particular the sensitive period for order, are a vital developmental need in children under 6 years, then it follows that failure to recognize and support sensitive periods may be a failure to meet children’s developmental needs and therefore may be harmful to children. It is vital to make teachers and the public aware of the power of sensitive periods in development for all children, especially for those with developmental problems, in a

similar way to that by which Perry is making teachers and the general public aware of the basics of brain development in children.

In conclusion, the findings of this study suggest that the NME and the Montessori Method share many commonalities. Specifically, Perry's findings in relation to the vital importance of positive relational interactions between adults and children to promote healthy human development are in line with Dr. Montessori's early emphasis on the necessity for the teacher to feel and demonstrate, in daily practice, a genuine love for the human child. The 6 R's recommended by the NME align with original Montessori principles which emphasize that the children's houses were relational, the activities were rhythmic, repetitive, relevant, and rewarding, and every aspect of the environment was respectful. This paper would argue that the neuroscience behind the NME sheds light on the early success of the Montessori Method in bringing social, emotional, and cognitive flourishing to large numbers of children. In addition, this gives reason for great optimism that the Method still has the power to promote human flourishing in our current times because Dr. Montessori's "scientific pedagogy" is still entirely replicable.

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## References

- Babini, V. (2000). Science, feminism, and education: The early work of Maria Montessori. *History Workshop Journal*, 49(1), 44–67.  
<https://doi.org/10.1093/hwj/2000.49.44>
- Babini, V., & Lama, L. (2000). *Una donna nuova: Il femminismo scientifico di Maria Montessori* [A new

woman: The scientific feminism of Maria Montessori]. Franco Angeli.

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

<https://doi.org/10.1191/1478088706qp063oa>

- Braun, V., & Clarke, V. (2022). *Thematic analysis: A practical guide*. SAGE Publications Ltd.
- Craig, S. E. (1992). The educational needs of children living with violence. *Phi Delta Kappan*, 74(1), 67–68, 70–71.

- Denervaud, S., Christensen, A., Kenett, Y., & Beaty, R. (2022). How school systems shape children's knowledge and creative abilities.

<https://npiscilearncommunity.nature.com>

- De Stefano, C. (2022). *The child is the teacher: A life of Maria Montessori*. Other Press.

- Fynne, R. J. (1924). *Montessori and her inspirers*. Longmans; Green and Co.

- Galitch, S. (2021). *Science—Montessori is good for the brain*. Archyworldys. <https://www.archyworldys.com/science-montessori-is-good-for-the-brain/>

- George, A. E. (1912). Dr. Maria Montessori: The achievement and personality of an Italian woman whose discovery is revolutionizing educational methods. *Good Housekeeping*, 55(1), 24–29.

- Grigsby, J., & Stevens, D. W. (2001). *Neurodynamics of personality*. The Guilford Publications.

- Horne, H. (1904). *The philosophy of education*. Macmillan Press.

- Itard, J. (1802). *An historical account of the discovery and education of a savage man*. Richard Phillips.

- Kramer, R. (1976). *Maria Montessori: A biography*. Basil Blackwell.

- Lillard, A., & Else-Quest, N. (2006). Evaluating Montessori education. *Science*, 313(5795), 1893–1894. <https://doi.org/10.1126/science.1132362>

- Ludy-Dobson, C. R., & Perry, B. D. (2010). The role of healthy relational interactions in buffering the impact of childhood trauma. In E. Gil (Ed.), *Working with children to heal interpersonal trauma: The power of play*. The Guilford Press.

- Montessori, M. (1909). Il metodo della pedagogia scientifica applicato all'educazione infantile nelle case dei bambini [The method of scientific pedagogy as applied to child education in the children's houses]. Scipione Lapi.

- Montessori, M. (1913). *Pedagogical anthropology* (F. T. Cooper, Trans.). Frederick A. Stokes Company.

- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Ed. And Trans.). Longmans; Green and Co.
- Montessori, M. (2013). The House of Children, Lecture, Kodaikanal, 1944. *NAMTA Journal*, 38(1), 11–19.
- Montessori, M. (1964). *The Montessori method* (A. E. George, Trans.). Schocken Books. (Original work published 1912)
- Montessori, M. (1967). *The absorbent mind* (C. A. Claremont, Trans.). Holt, Rinehart and Winston. (Original work published 1949)
- Montessori, M. (1971). *The Four planes of education*. Ami communications.
- Montessori, M. (1975). *The Formation of man*. (A.M. Joosten, Trans.) Kalakshetra Publications. (Original work published 1949)
- Montessori, M. (2008). *The California lectures of Maria Montessori, 1915: Collected speeches and writings* (R. Buckenmeyer, Ed.). Montessori-Pierson Publishing Company.
- Perry, B. D. (2009). Examining child maltreatment through a neurodevelopment lens: Clinical applications of the Neurosequential Model of Therapeutics. *Journal of Loss and Trauma*, 14(4), 240–255. <https://doi.org/10.1080/15325020903004350>
- Perry, B. D., & Szalavitz, M. (2017). *The boy who was raised as a dog: And other stories from a child psychiatrist's notebook—what traumatized children can teach us about loss, love, and healing*. Basic Books.
- Perry, B. D., & Winfrey, O. (2021). *What happened to you? Conversations on trauma, resilience, and healing*. Flatiron Books.
- Phillips, B., O'Toole, C., McGilloway, S., & Phillips, S. (2022). Montessori, the White Cross, and trauma-informed practice: Lessons for contemporary education. *Journal of Montessori Research*, 8(1), 13–28. <https://doi.org/10.17161/jomr.v8i1.15767>
- Radice, S. (1920). *The new children: Talks with Maria Montessori*. Frederick A. Stokes Company.
- Séguin, E. (1866). *Idiocy and its treatment by the physiological method*. William Wood & Co.
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. Plume.
- Stevens, E. Y. (1912). The Montessori Method and the American kindergarten. *McClure's Magazine*, 40, 77–82.
- ThinkTVPBS. (2020a, August 25). *Stress, trauma, and the brain: Insights for educators—the neurosequential model* [Video]. YouTube. [https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020b, August 25). *Stress, trauma, and the brain: Insights for educators—how stress impacts brain function* [Video]. YouTube. [https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020c, August 25). *Stress, trauma, and the brain: Insights for educators—the power of connection* [Video]. YouTube. [https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020d, August 25). *Stress, trauma, and the brain: Insights for educators—regulating yourself and your classroom* [Video]. YouTube. [https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)
- ThinkTVPBS. (2020e, August 25). *Stress, trauma, and the brain: Insights for educators—educator strategies for the classroom* [Video]. YouTube. [https://www.youtube.com/watch?v=\\_3is\\_3XHKKs&ab\\_channel=ThinkTVPBS](https://www.youtube.com/watch?v=_3is_3XHKKs&ab_channel=ThinkTVPBS)



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6 **Assessing the perceived effectiveness of a newly developed trauma-informed practice**  
7 **(TIP) programme for early childhood teachers.**  
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12 Bernadette Phillips<sup>a</sup>, Catriona O’Toole<sup>a</sup>, Stephen Phillips<sup>b</sup> and Sinead McGilloway<sup>c</sup>  
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4 **Assessing the perceived effectiveness of a newly developed trauma-informed practice**  
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6 **(TIP) programme for early childhood teachers.**  
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9

10 **Abstract**  
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12 Childhood adversity and trauma are widespread and there is increased recognition of the need  
13 for trauma-informed practice (TIP) (which recognizes the potentially long-term impact of  
14 trauma on individuals). Historical evidence shows that early Montessori schools were widely  
15 reputed to promote psychological healing in trauma-affected children. The aim of this study  
16 was to explore the perceived effectiveness (in terms of knowledge, attitudes, beliefs, and  
17 professional practice) of a new TIP programme designed to enhance the capacities of  
18 contemporary early childhood educators to support trauma-affected children. Eleven early  
19 childhood teachers in one Montessori school, took part in the study which utilized a qualitative,  
20 evaluative case study design. The results demonstrate post-programme increases in teacher  
21 self-reported knowledge of trauma, TIP, and early Montessori approaches, as well as positive  
22 reported changes in participants' attitudes, beliefs, and professional practice. However, there  
23 were mixed views on the overall feasibility of the programme due to perceived high-level  
24 barriers to wider acceptance and implementation. This study represents an original contribution  
25 to the fields of both TIP and Montessori research in providing some initial promising evidence  
26 as to how a new Montessori-attuned TIP programme can help to inform and empower teachers  
27 to integrate TIP into their daily professional practice.  
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48 **Keywords:** trauma-informed practice, Montessori schools, mental health, childhood  
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## Introduction

Increasing interdisciplinary research over the last 25 years (in the fields of medicine, epidemiology, neuroscience, psychology, sociology, and education) has shown that childhood adversity and trauma can negatively impact the physical, emotional, social, and cognitive functioning of children (Burke Harris 2019; Felitti et al. 1998; Herman 2015; National Scientific Council on the Developing Child NSCDC 2020; Perry & Szalavitz 2017; van der Kolk 2014), often contributing to poor mental health and wellbeing. Childhood adversity includes exposure to poverty, homelessness, discrimination, racism, as well as neglect, abuse, and other negative experiences (Felitti et al. 1998; Merskey et al. 2017). Trauma occurs when exposure to these types of adverse experiences overwhelm children emotionally and psychologically, often leading to *'lasting adverse effects on their mental, physical, social, emotional, or spiritual well-being'* (Substance Abuse and Mental Health Services Administration, SAMSHA 2014, p. 7). Specifically, research shows that exposure to adversity or trauma in childhood can potentially have a very damaging effect on a child's ability to develop attachments, regulate their emotions, make friends, collaborate with others, and use language, memory, or reasoning skills, all of which, in turn, may affect mental health and wellbeing (Cole et al. 2005, 2013; Craig 2016). As a consequence of these concerns, there is an increasing awareness, in recent years, of the need to make human services, including education, more trauma aware and trauma-informed (Alexander 2019; Jennings 2019; Maynard et al. 2019; Nicholson et al. 2023; Overstreet & Chafouleas 2016; Thomas et al. 2019).

The Montessori Method is an educational approach developed by Maria Montessori (1870 to 1952), who was recognised by her contemporaries and later scholars as *'a brain specialist'* (Radice 1920, 1), an *'expert in children's mental illnesses'* (Gutek and Gutek 2016, 32), a *'competent clinical psychiatrist'* (Povell 2010, 40), and a woman who *'carved out a remarkable career, from psychiatrist to educationalist'* (Babini 2000, 45). Initially, Montessori

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4 worked with ‘mentally challenged’ children at the Orthophrenic Clinic in Rome of which she  
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6 was a co-director. Here, she worked with children who had been removed from their homes  
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8 and schools because they could not function in either (Montessori 2008). Later, in 1907, her  
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10 *Case dei Bambini* or “Children’s Houses” were opened in San Lorenzo, an impoverished  
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12 district in Rome, as part of a social project aimed to ameliorate the lives of the children and  
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14 families who lived there (De Stefano 2022; Kramer 1976: Montessori, 1912/1964). It is  
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16 estimated that there are approximately 16,000 Montessori schools around the world (Debs et  
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18 al. 2022; Debs 2023) and, in Ireland, Montessori/early childhood settings for children between  
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20 3 and 6 years are widespread.  
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24 Historical literature shows that Montessori early childhood settings can be healing  
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26 environments for young children who have been affected by adversity and/or trauma (Bailey,  
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28 1915; Cromwell 1916/2006; Fisher 1912). In fact, in 1917, Montessori tried to establish free  
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30 interdisciplinary programmes to help teachers and nurses to support children affected by  
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32 trauma arising from exposure to wars and natural disasters (Montessori 1917/2013). However,  
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34 apart from three relatively recent publications, there is a marked gap in contemporary literature  
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36 relating to Montessori’s expertise and involvement with trauma-affected children and what we  
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38 can learn therein (De Stefano 2022; Moretti 2021; Phillips et al. 2022). This newly developed  
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40 programme, which integrates contemporary trauma theory with Montessori’s original practices  
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42 with trauma-affected children, helps to fill this gap.  
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#### 46 The Programme

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48 The overarching aim of the new Montessori-attuned, trauma-informed practice  
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50 programme, was to enhance the capacity and skills of early childhood teachers, and specifically  
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52 to expand and deepen their understandings, attitudes, beliefs, and practices in ways that will  
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54 enable them to better support trauma-affected children (Guskey 2002). The programme content  
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4 is based on an analysis of contemporary trauma theory coupled with an in-depth analysis of  
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6 Montessori's approach to healing adversity-experienced and trauma-affected children (Phillips  
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8 et al., 2022). The specific objectives of the programme are: (1) to provide practitioners with an  
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10 in-depth knowledge of the nature and impact of childhood adversity and childhood trauma and  
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12 its potential long-term negative effect on the physical, emotional, social, and cognitive  
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14 functioning of developing children; (2) to equip practitioners with Montessori-informed  
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16 knowledge and information about child mental health and psychological healing; (3) to convey  
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18 an understanding of what 'trauma-informed practice' is and how a school can incorporate it  
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20 into their school policies, culture and ethos and (4) to provide an understanding of how  
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22 contemporary early childhood education settings and Montessori schools can infuse  
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24 Montessori-attuned, trauma-informed principles into their daily practice. The programme  
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26 comprises 4 x 5-hour sessions conducted over a period of eight weeks in the Autumn semester,  
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28 followed by 2 x follow-up sessions in the Spring semester. In this study, all sessions were  
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30 delivered on-site (by the first author) using a mix of didactic methods and discussion/debate.  
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32 Table 1 (below) provides an overview of the programme.  
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## 42 **Method**

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44 For the purposes of this project, an evaluative case study design was chosen because it can  
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46 provide 'educational actors or decision-makers (administrators, teachers, parents, pupils, etc.)  
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48 with information that will help them to judge the merit and worth of policies, programmes, or  
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50 institutions' (Stenhouse 1988 50).  
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### 54 **Participants and setting**

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4 One school, located in a suburban town west of Dublin (Ireland) and all of its teaching staff  
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6 (including the manager) n=11, agreed to participate in the study. This particular school was  
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8 chosen because it had a significant number of qualified Montessori teachers, (over half) and a  
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10 low staff turnover/high staff retention; for example, most of the teachers had worked there for  
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12 over a decade and so were very experienced. It is a Montessori preschool and creche which  
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14 offers full day care for children from 2 ½ to 5 years, and out of school care to children from 4  
15  
16 to 12 years. It is open 51 weeks a year, from 7:30 am to 6 pm only closing on bank holidays.  
17  
18 All meals are provided, along with homework-support, games, and recreational activities.  
19  
20 There are four well decorated, bright classrooms and a large and equally well-equipped outdoor  
21  
22 play area.  
23

24  
25 Of the 11 teachers who participated in the research, over half had diplomas/certificates  
26  
27 in Montessori pedagogy and the other half had levels of training in Early Childhood Education  
28  
29 and Care up to degree level. Several staff also had training related to the care of children with  
30  
31 additional needs. Professional development was highly regarded by staff members and all staff  
32  
33 are trained in First Aid, (with several staff trained in the First Aid Responder Course, FAR),  
34  
35 Child Protection & Safeguarding, and Food Hygiene. The children and families using the  
36  
37 service live in the immediate locality and surrounding areas. Up to 20% of the children  
38  
39 attending the school may have refugee status in any given year, and their first language is  
40  
41 usually not English. These children and their families live in 'Direct Provision', a system of  
42  
43 asylum seeker accommodation used in Ireland (which typically involves living in one room  
44  
45 (e.g., a hotel room) with communal kitchen and bathroom facilities).  
46  
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## 50 **Measures**

51  
52 A Topic Guide was developed for purposes of holding two focus groups with all participants  
53  
54 in the Spring semester following the delivery of the programme. This was based on a detailed  
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4 review of the relevant literature and included questions around the participants prior knowledge  
5  
6 (if any) of childhood trauma, TIP, and Montessori's historical involvement with trauma-  
7  
8 affected children. Questions relating to the participants' attitudes and beliefs relating to  
9  
10 'difficult' behaviours in children were also posed. In addition, participants were asked to give  
11  
12 their opinions on the feasibility of the programme. Detailed fieldnotes were also recorded by  
13  
14 the facilitator (the first author) during the entire process of programme start-up and delivery.  
15  
16

### 17 18 19 **Data Analysis**

20  
21 The qualitative data were analysed using Braun and Clarke's Reflexive Thematic Analysis  
22  
23 (RTA: Braun and Clarke 2022). This method involves an iterative process. Step 1 involves  
24  
25 'Familiarisation with the dataset' by reading and re-reading the literature, taking note of any  
26  
27 recurring features and the researcher's initial thoughts about how to begin to code the data.  
28  
29 Step 2 involves 'Coding the data', i.e. creating meaningful, relatively short 'labels' that extract  
30  
31 recurring ideas out of the data. From the outset, the codes created are recognised as representing  
32  
33 the researcher's interpretations of patterns of meaning across the data set. There is no attempt  
34  
35 to disengage the researcher's subjectivity from the analytical process, rather, RTA is built on  
36  
37 what Braun and Clarke call the researcher's 'critical reflection on your role as researcher, and  
38  
39 your research practice' (Braun and Clarke 2022, 5). Step 3 involves 'Generating themes', i.e.,  
40  
41 starting to identify potential themes. In this study we adopted a deductive approach, in that the  
42  
43 identification of themes was influenced by existing theories and knowledge. Step 4 involves  
44  
45 'Reviewing and developing the themes' through an iterative process of refinement of the  
46  
47 potential themes. Some themes may be combined with others, and some may be eliminated.  
48  
49 Step 5 involves 'Naming the themes' i.e., giving each theme a clear and engaging description  
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51 while the final step involves the write-up of the findings.  
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## Findings

Six themes were identified from the analysis and are discussed below. Pseudonyms are used to protect the anonymity of the participants.

### *The importance of repetitive, rhythmic activities in the healing of trauma*

Montessori's emphasis on the importance of movement and rhythmic activities to promote regulation in children was discussed in the sessions using many examples based on the participants' practical day-to-day experiences with children. Specifically, we discussed Montessori's discovery that repetitive gross motor rhythmic activities such as sweeping, scrubbing, polishing, and repetitive small motor activities involving comparing, contrasting, categorising, can help to calm the body's stress response system (Phillips et al. 2022; Phillips 2022). Building on this, the programme introduced the participants to the Neurosequential Model in Education (NME) and in particular its emphasis on the importance of repetitive, rhythmic activities in the healing of trauma. The teachers, both Montessori trained and not, showed great interest in this TIP model, and were intrigued that Perry's work which is based on contemporary neuroscientific principles confirms what Montessori intuited over a century ago and they could clearly see how Montessori's work anticipated Perry's neuroscientific insights into the power of "*patterned, repetitive, rhythmic activities*" (Perry 2009, 243) to reduce anxiety and calm the dysregulated brain.

Two of the participants, Luisa and Katerina, said – '*We find those 3 R's, Perry's 3 R's 'regulate, relate and reason' really work*'. They described a little boy in one of their classes who often becomes dysregulated, leading to 'difficult' behaviours and noted that offering him a rhythmic activity (in this case vigorously cleaning chairs) helped to sooth him. Katerina said - '*When he is here for the full day, he can be very difficult*'. Luisa added that the effect of this activity on him was amazing – '*He just calmed down*'. They said they now see clearly that this

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4 calming is brought about by the repetitive, rhythmic movements, and they noted (as Montessori  
5 did) that whenever children calm down following engagement in regulatory, rhythmic  
6 activities, it is then that they can ‘relate’ or reach out in a sociable manner to other adults or  
7 children.  
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### 15 ***The importance of positive relational interactions in TIP***

16  
17 Another aspect of the NME that was examined in detail during the sessions was  
18 relational neurobiology (i.e., the science that recognizes that humans are relational creatures  
19 and thrive on being socially accepted) and the importance both Perry and Montessori place on  
20 positive relationships, and positive relational interactions, in the healing of trauma-affected  
21 children. Specifically, Montessori’s emphasis on the role of positive relational interactions in  
22 the healing of trauma-affected children was discussed. The participants were very interested in  
23 Montessori’s accounts of the first children with whom she first worked, who were expelled  
24 from their schools and labelled ‘mentally challenged’ and incapable of learning. However,  
25 when she applied what we now consider principles of relational neurobiology, many of these  
26 children started to engage in academic learning and even passed their State Examinations. The  
27 participants stated that Montessori’s clear description of how she put relational neurobiology  
28 into practice was very helpful to them. For example, when the street children entered her school  
29 in 1897, she described how she greeted them with “*hearty manifestations of welcome and with*  
30 *genuine cordiality*” and she said, “*For the first time they were made to feel that they were*  
31 *wanted and desired*” (Montessori 2008 264). Participants stated that these specific quotations  
32 helped them to understand how relational neurobiology is applied in daily practice.  
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51 There was a clear consensus that this was one of the most important factors in TIP and  
52 was also the easiest element to implement. For example, Loretta commented that ‘*a little bit of*  
53 *love, a little bit of affection, they crave it, and they thrive on it too*’. There were lively  
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4 discussions in which they agreed with Perry's view that the most important healing experiences  
5  
6 in the lives of trauma-affected children do not occur in therapy itself (Perry & Szalavitz, 2017),  
7  
8 but in simple actions such as a warm smile from the teacher on arrival, a 'high five' throughout  
9  
10 the day, or a pat on the shoulder and a 'well done Jonny'/'well done Mary.' They also  
11  
12 appreciated how Montessori's work anticipated Perry's neuroscientific insights into the power  
13  
14 of positive relational interactions to help children to become resilient and overcome trauma,  
15  
16 (Ludy-Dobson & Perry 2010).  
17

18  
19 There were equally engaged discussions on the importance of the *power of community*  
20  
21 to support trauma-affected children, especially refugee children, to experience a sense of  
22  
23 belonging and to feel safe and loved. For example, Luisa commented,  
24  
25

26  
27 *'This could be their only safe space. These three hours a day could be the only time*  
28  
29 *they can just let go, feel safe, have fun with their friends - then they go back to a hotel*  
30  
31 *room (i.e., Direct Provision).'*  
32  
33

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35  
36 Another participant, Giovanna said, *'this little community may well be the only place where the*  
37  
38 *children get to speak English'* in the company of other children. She noted that many of the  
39  
40 refugee parents do not speak English at all and that their children seemed to derive a feeling of  
41  
42 belonging and community just from having the opportunity to speak English with the other  
43  
44 children. *'They feel like they belong'* Loretta said.  
45

46  
47 Participants engaged in lively and sometimes emotional discussions about the  
48  
49 importance of positive relationships in human development and how these are key to the  
50  
51 healing of trauma-affected children. Some participants said that they now found themselves  
52  
53 reflecting on their own past experiences in the light of this new knowledge and were beginning  
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4 to see things differently. Isabella, one of the early childhood educators, reflecting on her new  
5  
6 understanding of the power of positive relationships in human development said,  
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10 *Now I have obsession to tell my daughter “I love you, I love you, I love you” because I*  
11 *did not feel that love when I was growing up ... I did not get hug ... or she never tell me*  
12  
13 *“I love you” – I want to be different with my daughter.*  
14  
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18  
19 Luisa, one of the Montessori teachers said *‘it’s really exciting’* to see how Montessori (like  
20  
21 Perry in later years) backed up her *regulatory* activities (such as scrubbing a table), with  
22  
23 *relational exercises* through the use of her (now quaintly named) *Exercises of Grace and*  
24  
25 *Courtesy* which essentially were lessons in the form of ‘mini dramas’ acted out by children  
26  
27 which aim to promote positive relational interactions between children and their peers through  
28  
29 embodied learning (e.g. how to wait, take turns, or resolve a disagreement) and as the archival  
30  
31 literature shows, were helpful in addressing bullying in schools (Phillips et al., 2022; Phillips,  
32  
33 2022). Overall, participants stated that the interdisciplinary knowledge to which they were  
34  
35 introduced as part of the programme, especially in relation to the NME, increased their  
36  
37 knowledge significantly, whilst also encouraging and empowering them to take the necessary  
38  
39 steps towards becoming a trauma-informed school.  
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#### 44 ***Greater understandings of children’s behaviour***

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46  
47 When asked during the focus groups about the extent to which the new TIP programme had  
48  
49 changed some of their attitudes and/or beliefs, there was a consensus amongst participants that  
50  
51 their understanding of children’s ‘difficult’ behaviour had improved, and their compassion had  
52  
53 increased. *‘You couldn’t but be changed by it – for the better – you know’*. (Loretta). Another  
54  
55 participant, Shania, described her sadness and frustration at what she perceived as a lack of  
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4 understanding from a primary school teacher from whom she daily collected a child to take  
5  
6 him back to their afterschool. She said the teacher was usually very critical of the child's  
7  
8 behaviours in school but noted that *'She didn't take into account the child's living*  
9  
10 *circumstances.* She commented:

11  
12  
13  
14 *He's a child in Direct Provision – he's basically homeless, living in a hotel room and*  
15  
16 *they are not taking any of that into consideration – they are criticising him, saying he's*  
17  
18 *crying because he didn't get the jelly sweet (i.e., reward for good behaviour).*  
19  
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22  
23 Another participant, Loretta added,

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25  
26  
27 *'If they [primary school teachers] were trained in TIP, it would totally change their*  
28  
29 *attitudes ...I wonder are they ever going to introduce something like this into the*  
30  
31 *[primary]schools so they would be trauma informed? It would make such a difference*  
32  
33 *to their practice, wouldn't it really?'*  
34  
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37

38 These comments indicate that the new programme appeared to have had a substantial impact  
39  
40 on the participants' attitudes and increased their, already high, levels of empathy and  
41  
42 compassion for children. It also appears to have convinced them of the need for the programme  
43  
44 to become part of initial and on-going teacher education at both primary and post-primary  
45  
46 levels. Changes in participants beliefs especially in relation to children's behaviour was also a  
47  
48 topic of considerable discussion in the focus groups. In general, the participants revealed that  
49  
50 prior to participating in the programme, they had a deeply held compassionate approach to  
51  
52 children's behaviour and that the course had confirmed their 'gut feeling 'that there is always  
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4 an underlying reason for difficult behaviour in children, as illustrated by the following  
5  
6 comment:

7  
8 *I always believed that there was most likely an underlying cause for difficult behaviour,*  
9 *but never knew or understood how trauma could affect the child.*

### 10 11 12 13 14 15 ***Appreciation of a teacher's impact on a child's life***

16  
17 Participants also discussed how the programme had changed their attitudes and beliefs  
18 in relation to the significant impact of a teacher on a child's life. During one of the sessions,  
19 Katerina, one of the early childhood educators described teachers as *'the foundations for the*  
20 *child's life – we can give them self-esteem, confidence, safety.'* This led to an animated  
21 discussion among the teachers on how even their preliminary efforts to help dysregulated  
22 children (especially refugee children) were being supported by the learning they had gained on  
23 the course. Some participants excitedly recounted their experiences of implementing the  
24 programme with the children –  
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35  
36 *Our lunch time conversations are all about this (TIP) now. We run in and out of each*  
37 *other's classrooms telling each other what we tried with certain children and how great*  
38 *it's working ... It's definitely impacting on the service, and in a good way.*  
39  
40  
41

42 It was also noted during the observation of the sessions that the teachers' sense of the positive  
43 role they can play in changing the trajectory of a child's life is not a theoretical one but  
44 something that, it was felt, could be achieved through simple, practical day-to-day steps.  
45  
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48 Several participants, reflecting on their own early school years, recollected teachers  
49 who had identified their strengths and built on them. One participant recalled a teacher who  
50 recognised her strong interest in reading and actively encouraged it by loaning her books and  
51 suggesting she enrol in the local library. The participant said her career as an early years  
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4 educator which she loves and derives great personal satisfaction from, is attributable, in no  
5  
6 small way, to this teacher's efforts. Another participant remarked - *'educators have a lot of*  
7  
8 *power to change a child's life - even a trauma-affected child's life - through ordinary everyday*  
9  
10 *things - like - like this - identifying a child's strengths and building on them'*.  
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### ***The practice-related benefits of inter-disciplinary knowledge***

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16  
17 Another theme identified from the findings, related to the participants' appreciation of  
18  
19 the benefits of interdisciplinary knowledge about trauma/adversity, TIP, and Montessori, and  
20  
21 how this can be effectively translated into professional practice. One participant, Loretta (who  
22  
23 was the owner/manager of the setting) stated, *'I think it [the programme] has increased our*  
24  
25 *knowledge 100-fold' because of the wealth of knowledge it gave us*". Another said, *'I never*  
26  
27 *thought that research from medicine, neuroscience, etc., would have any relevance to*  
28  
29 *education'*.  
30

31  
32 Many participants indicated that the interdisciplinary nature of the programme was really *'eye-*  
33  
34 *opening'*. All also agreed that the knowledge they had gained from participating in the  
35  
36 programme about (a) the widespread nature and prevalence of adversity, (b) the effects of  
37  
38 trauma on the brain; (c) TIP; and (d) Montessori's involvement with trauma-affected children,  
39  
40 was new to them. A number of participants said that this interdisciplinary knowledge has made  
41  
42 them *'more tuned in now'* and *'more aware of the possibility that there has been trauma in a*  
43  
44 *child's life,' and made them more confident in their professional practice about responding to*  
45  
46 *trauma-affected children using TIP principles.*  
47

48  
49 In the final focus group, many participants stated that the programme had *'transformed'*  
50  
51 *their knowledge, attitudes, beliefs, and professional practice.* Loretta, the owner/manager of  
52  
53 the school acknowledged that they had started from the vantage point of being a good school,  
54  
55 where compassion, kindness, consideration, and love for the children, as well as high standards  
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4 of learning and development were well established in daily practice. Despite this, she and the  
5  
6 other teachers found the course to be *'transformational'* in that it changed the lens through  
7  
8 which they viewed children. Specifically, she stated that they all now apply a trauma-informed  
9  
10 lens when they encounter what in the past would have been seen as children with 'difficult' or  
11  
12 'challenging' behaviours. Loretta, the manager stated,

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16  
17 *'It's been transformational – totally transformational. The way we view children now*  
18  
19 *is so different. Now, we immediately ask the question 'What happened to you?' rather*  
20  
21 *than 'What's wrong with you?'*  
22  
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24  
25 She added, *'This programme has had a hugely positive impact on our professional practice'*.  
26  
27 She then added that recently when the setting had a routine inspection, and upon telling the  
28  
29 inspector that the staff had just completed this TIP programme, the inspector was very  
30  
31 complementary of the setting, praising the calmness in the children, and the warm,  
32  
33 understanding, and loving interactions between the staff and the children. Loretta, said, *'It was*  
34  
35 *lovely to hear, when she [the inspector] said "There's so little to improve - such a warm*  
36  
37 *atmosphere – throughout the whole service"* The manager attributed much of this positive  
38  
39 professional practice to the way staff had embraced key messages of the programme.  
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#### 44 ***The feasibility of the programme***

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46 The final theme focused on the participants' opinions on the feasibility of the  
47  
48 programme. Here, the opinions were mixed. On the one hand, all of the participants felt that  
49  
50 the programme had been hugely beneficial to their practice and recommended that it be made  
51  
52 widely available to preschools, primary schools, and second-level schools. Loretta said, -

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54  
55 *'Montessori is the perfect vehicle for introducing TIP.'* Luisa added:  
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6 *I think Montessori is the ideal method for it [TIP] because of all the repetition and what*  
7 *we've learnt is that repetition is what regulates the child – they go hand in hand – we've*  
8 *seen it ourselves – how it calms and regulates.*  
9  
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14 Loretta said, *'For a child that has suffered trauma, it is a perfect thing for them – to be allowed*  
15 *to repeat activities and self-regulate.'* Luisa made the point that the Montessori approach is  
16 'perfect' for the growing number of refugee children who often do not speak English, because  
17 it can help them to regulate their emotions without the need for language:  
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25 *In Montessori, it doesn't matter what language you speak – you can show someone in*  
26 *silence - you don't have to use language... I think it will be very beneficial for those*  
27 *children [refugees] - they can be included in the self-regulation without language*  
28 *barriers.*  
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36 On the other hand, some participants felt that the Montessori approach is not favoured as much  
37 as it used to be by the Irish preschool inspectorate since the introduction of Aistear, the National  
38 Curriculum Framework, in 2009. Therefore, they felt that there might not be an appreciation  
39 of its capacity to support children to regulate their emotions through the use of the Montessori  
40 Practical Life exercises, nor an appreciation of its capacity to promote positive, relational  
41 interactions through its use of other socially oriented Montessori exercises. However, the  
42 perceived commonalities between the NME and the Montessori approach (enshrined within the  
43 new programme) were thought to possibly enhance the feasibility of programme roll-out into  
44 the future.  
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## Discussion and implications

The aim of this study was to assess the perceived impact of a newly developed programme for early childhood educators. The findings indicated post-programme increases in teacher self-reported knowledge of trauma, TIP, and early Montessori approaches with trauma-affected children, as well as positive reported changes in the attitudes, beliefs, and professional practice of the participants. However, there were mixed views among the participants on the feasibility of the programme and especially in the context of wider curriculum changes in an Irish context. Arguably, however, the programme has a number of unique features which may appropriately compliment current early childhood approaches and practices both in Ireland and elsewhere. Firstly, the programme content is interdisciplinary, innovative and research informed, thereby bringing new knowledge and understanding to educators on for example, the importance of regulatory activities, and positive relational interactions in helping children heal from trauma; thus it provides teachers with practical strategies and approaches that enhance their capacity to help and support vulnerable children.

Secondly, by providing knowledge about the neurobiology of trauma, and its effects on the emotional, social, and cognitive functioning of children (i.e. which frequently manifest as negative behaviours in the classroom), teachers are helped to avoid misjudging children and believing that their behaviours are caused by defiance or wilfulness, when, in fact, they may be caused by processes more to do with the effects of trauma. Without this knowledge, teachers often unintentionally mis-label children because their behaviours are misunderstood (Mulholland & O'Toole, 2021). However, a teacher equipped with this knowledge is better able to understand trauma-affected children and so prevent re-traumatisation by mis-labelling them (Craig, 2016).

Thirdly, the interdisciplinary knowledge provided on this programme improves teacher awareness of the many social injustices (poverty, unemployment, low wages, unaffordable

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3  
4 housing, discrimination, and racism) which are often the root causes of trauma in children.  
5  
6 Arguably, this kind of awareness can lead to more understanding of and compassion for the  
7  
8 circumstances of many children. Indeed, if incorporated into early childhood teacher education,  
9  
10 this programme may play a vital role in advancing greater equity in our schools, because  
11  
12 trauma-affected children would be more likely to be given the support which they need and to  
13  
14 which they are entitled under Article 39 of the UN Convention on the Rights of the Child  
15  
16 (UNCRC, 1989).  
17

18  
19 The findings reported here show that the new TIP programme had a positive reported  
20  
21 impact on the teachers' knowledge, attitudes, beliefs, and professional practice. It had helped  
22  
23 them to see the commonalities between the Montessori approach to helping trauma-affected  
24  
25 children and contemporary trauma-informed approaches, especially the 'regulate, relate, and  
26  
27 reason' model developed by Perry and the Neurosequential Network ([www.neurosequential.com](http://www.neurosequential.com)).  
28  
29 This knowledge helped the participants to feel empowered to increase their use of Montessori  
30  
31 activities/exercises that historically have been found to be beneficial in the healing of trauma-  
32  
33 affected children. Another factor to emerge from the findings was the association between the  
34  
35 participants' feelings of compassion for children especially those that are homeless and living  
36  
37 in Direct Provision, and their positive attitude towards the TIP programme and its feasibility.  
38  
39 This is consistent with the findings of a recent study in Ireland which showed that compassion  
40  
41 and being sensitive to the suffering of others, as well as self-compassion (i.e., which entails  
42  
43 turning towards our own painful experiences and extending understanding to ourselves) were  
44  
45 the strongest predictors of positive attitudes toward TIP (OToole and Dobutowitch 2023).  
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49 Notably, there was no attrition throughout the duration of the programme and there was  
50  
51 an extremely high level of enthusiasm, interest, and participation throughout. This may have  
52  
53 been due to the group dynamic and the fact that there were long-standing relationships of trust,  
54  
55 commitment to each other, and to the school. Notwithstanding this possibility, the participants  
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4 reported putting their theoretical knowledge into practice after the very first session and they  
5  
6 began each subsequent session with informal though detailed and animated comments on how  
7  
8 they were finding the implementation of the programme in their classrooms. Overall, they felt  
9  
10 that their experience of engaging in the programme was “transformational”, providing them  
11  
12 with a new way of working which helped them to see children through a trauma-informed lens.  
13  
14 Indeed, this has been shown to be the hallmark of “transformational learning” (Mezirow, 1991),  
15  
16 which is based on the idea that adult learners, when they are given new information, begin to  
17  
18 evaluate their past experiences in the light of that new information, and often begin to change  
19  
20 their perspectives and worldview as they critically reflect on their past often leading to new  
21  
22 insights.  
23  
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25  
26 The content of some of the sessions involved issues of a sensitive nature which may  
27  
28 have been relevant to participants’ past, and there was a need, therefore, for sensitivity during  
29  
30 programme delivery. The course facilitator, (who is also the first author) felt a constant need  
31  
32 to reflect on the ethical responsibility to protect the participants from emotional harm and to  
33  
34 create and maintain a safe space in which they could share their thoughts and opinions (Carello  
35  
36 and Butler 2015). Overall, despite the nature of the content, the participants reported enjoying  
37  
38 the programme and there were many discussions in which shared experiences provoked  
39  
40 laughter as well as tears. The participants indicated that it had become their ‘lunchtime  
41  
42 conversation’ thereby suggesting that the knowledge and principles which they had learned,  
43  
44 were already being embedded into the ethos and culture of the school. This is important because  
45  
46 considerable evidence suggests that such whole-school approaches offer the most effective  
47  
48 means to incorporate trauma-informed approaches within schools and other educational  
49  
50 settings (Cole et al. 2005; Craig 2016).  
51  
52

53  
54 This study was limited in a number of ways. First, the participants were from just one  
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56 school thereby limiting the generalisability of the findings. Second, the school was atypical in  
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4 that the majority of the teachers had been there for a long time and there was minimal staff  
5 turnover. However, this should also be construed as a strength of the study and a positive factor  
6 in terms of offering stability and quality care to the children attending the service. However, it  
7 would not be typical of childcare in many countries (including Ireland) where frequently, staff  
8 turnover tends to be high, due to the low salaries often associated with childcare professions  
9 (Caven 2021). Furthermore, the school was atypical in that over half of the staff were qualified  
10 in Montessori pedagogy, whereas in many early childhood settings around the world who use  
11 the Montessori name, only a few of the teachers are qualified in Montessori pedagogy and so,  
12 in daily practice, they often stray from Montessori principles, raising questions about “fidelity  
13 issues” (Murray 2023). This was not the case in this setting.  
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27 In summary, the findings reported here, albeit based on a single exploratory study,  
28 provide initial promising indications that the new TIP can improve knowledge, attitudes,  
29 beliefs and behaviours around trauma-informed care and practice. The findings are particularly  
30 timely because, currently, many countries have made a commitment to help child refugees from  
31 war-torn/conflict-affected areas across the world; it is important, therefore, for educators to  
32 have access to pedagogical approaches that have been shown to help trauma-affected children.  
33 Arguably, the Montessori method is such an approach, and indeed, its capacity to help  
34 ameliorate the effects of childhood trauma and promote mental health is now being increasingly  
35 recognised and promoted (Phillips et al. 2022; Phillips 2022; Cossentino 2016). However, more  
36 large-scale mixed methods research is needed to extend the delivery and subsequent evaluation  
37 of the programme using a larger sample of participants and schools across a range of early  
38 childhood education settings (and located in both rural and urban areas) and with several  
39 follow-up assessments. An attendant cost-effectiveness analysis would also provide useful  
40 insights into the programme’s value for money relative to its outcomes.  
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17 The study received ethical approval from Maynooth University's Social Research Ethics Sub-  
18 Committee.  
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55  
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57  
58  
59  
60

## References

- Alexander, Jen. 2019. *Building Trauma-Sensitive Schools: Your Guide to Creating Safe, Supportive Learning Environments for All Students*. Brookes Publishing Company.
- Babini, Valeria Paola. 2000. "Science, Feminism and Education: The Early Work of Maria Montessori." *History Workshop Journal* 49, no. 1: 44–67. <https://doi.org/10.1093/hwj/2000.49.44>.
- Bailey, C. S. (1915). *Montessori children*. Holt
- Braun, Virginia, and Victoria Clarke. 2022. *Thematic Analysis: A Practical Guide*. SAGE.
- Burke Harris, Nadine. 2019. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. Marine Books.
- Carello, Janice and Lisa Butler 2015 "Practicing what we teach: Trauma-informed educational practice." *Journal of Teaching in Social Work*. Vol 35, (3) 262-278. <https://doi.org/10.1080/08841233.2015.1030059>
- Caven, Meg. 2021. Understanding teacher turnover in early childhood education. Yale school of medicine. <https://medicine.yale.edu/news-article/understanding-ece-teacher-turnover>
- Cole, S. F., Greenwald O'Brien, J., Gadd, M. G., Ristuccia, J., Wallace, D. L., & Gregory, M. 2005. *Helping traumatized children learn: Supportive school environments for children traumatized by family violence*. Massachusetts Advocates for Children, Trauma and Learning Policy Initiative. <https://traumasensitiveschools.org/wp-content/uploads/2013/06/Helping-Traumatized-Children-Learn.pdf>
- Cole, Susan F., Anne Eisner, Michael Gregory, Joel Ristuccia, Trauma and Learning Policy Initiative, Massachusetts Advocates For Children, and Harvard Law School. 2013. *Helping Traumatized Children Learn: Creating and Advocating for Trauma-Sensitive Schools*.

- 1  
2  
3  
4 Cossentino, Jaqueline. (2016). Montessori schools help children exposed to trauma. In L.  
5  
6 Flores Shaw (Ed.), *The Montessori White Papers, Vol. 2* (pp. 9–16). White Paper  
7  
8 Press.  
9
- 10  
11 Craig, Susan. 2016. *Trauma-Sensitive Schools: Learning Communities Transforming*  
12  
13 *Children's Lives, K–5*. Teachers College Press.
- 14  
15 Cromwell, M. (2006). The Montessori Method adapted to the little French and Belgian  
16  
17 refugees. *AMI Communications*, 2, 11–13. (Original work published 1916)
- 18  
19 Debs, Mira, Jaap de Brouwer, Angela K. Murray, Lynne Lawrence, Megan Tyne, Candice  
20  
21 von der Wehl. 2022. “Global Diffusion of Montessori Schools: A Report From the  
22  
23 2022 Global Montessori Census” *Journal of Montessori Research* 8(2). 1-15.  
24  
25 <https://doi.org/10.17161/jomr.v8i2.18675>  
26
- 27  
28 Debs, Mira. 2023. “Global Montessori Education”, pps. 283-289. In Murray, Angela, Eva-  
29  
30 Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. 2023. *The Bloomsbury*  
31  
32 *Handbook of Montessori Education*. Bloomsbury Publishing.
- 33  
34 De Stefano, Cristina. 2022. *The Child Is the Teacher: A Life of Maria Montessori*. Other  
35  
36 Press, LLC.
- 37  
38 Felitti, Vincent J., Robert F. Anda, Dale Nordenberg, David F. Williamson, Alison M. Spitz,  
39  
40 Valerie J. Edwards, Mary P. Koss, and James S. Marks. 1998. “Relationship of  
41  
42 Childhood Abuse and Household Dysfunction to Many of the Leading Causes of  
43  
44 Death in Adults.” *American Journal of Preventive Medicine* 14 (4): 245–  
45  
46 58. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8).  
47
- 48  
49 Fisher, D. C. 1912. *A Montessori mother*. Henry Holt & Company.
- 50  
51 Guskey, Thomas R. 2002. “Professional Development and Teacher Change.” *Teachers and*  
52  
53 *Teaching* 8 (3): 381–91. <https://doi.org/10.1080/135406002100000512>.  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3  
4 Gutek, Gerald L., and Patricia A. Gutek. 2016. *Bringing Montessori to America: S. S.*  
5  
6 *McClure, Maria Montessori, and the Campaign to Publicize Montessori Education.*  
7  
8 University of Alabama Press.  
9
- 10 Jennings, Patricia A. 2019. *The Trauma-Sensitive Classroom: Building Resilience with*  
11  
12 *Compassionate Teaching.* W. W. Norton & Company.  
13
- 14 Kramer, Rita. 1976. *Maria Montessori: A Biography.* Addison-Wesley.  
15
- 16 Maynard, Brandy R., Anne S. J. Farina, Nathaniel A. Dell, and Michael S. Kelly. 2019.  
17  
18 “Effects of Trauma-informed Approaches in Schools: A Systematic Review”  
19  
20 *Campbell Systematic Reviews* 15 (1–2). <https://doi.org/10.1002/cl2.1018>.  
21  
22  
23
- 24 Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the Measurement of  
25  
26 Adversity. *Child maltreatment*, 22(1), 58–68.  
27  
28 <https://doi.org/10.1177/1077559516679513>  
29
- 30 Mezirow, Jack. 1991. *Transformative Dimensions of Adult Learning.* Jossey-Bass.  
31
- 32 Montessori, Maria. (2013). The White Cross. *AMI Journal*, 1-2, 37–41. (Original work  
33  
34 published 1917)  
35
- 36 Montessori, Maria. (2008). *The California Lectures of Maria Montessori, 1915; Collected*  
37  
38 *speeches and writings* (R. Buckenmeyer, Ed.). The Clio Montessori Series.  
39  
40  
41 Montessori-Pierson.  
42
- 43 Montessori, Maria. (1964). *The Montessori Method* (A. E. George, Trans.) Schocken Books.  
44  
45 (Original work published 1912)  
46
- 47 Moretti, Erica. 2021. *The Best Weapon for Peace: Maria Montessori, Education, and*  
48  
49 *Children’s Rights.* University of Wisconsin Pres.  
50
- 51 Murray, Angela, Eva-Maria Tebano Ahlquist, Maria McKenna, and Mira Debs. 2023. *The*  
52  
53 *Bloomsbury Handbook of Montessori Education.* Bloomsbury Publishing.  
54  
55  
56  
57  
58  
59  
60

1  
2  
3  
4 Mulholland, Michaela., and Catriona O’Toole. (2021). When it matters most: A trauma-  
5  
6 informed, outdoor learning programme to support children’s wellbeing during Covid-  
7  
8 19 and beyond. *Irish Educational Studies*, 40 (2), 329-340.

9  
10 <https://doi.org/10.1080/03323315.2021.1915843>

11  
12 National Council for Curriculum and Assessment, NCCA, 2009. “Aistear: The Early  
13  
14 Childhood Curriculum Framework”.

15  
16 Neurosequential Network, [www.neurosequential.com](http://www.neurosequential.com)

17  
18 Nicholson, Julie, Linda Perez, Julie Kurtz, Shawn Bryant, and Drew Giles. 2023. *Trauma-*  
19  
20 *Informed Practices for Early Childhood Educators: Relationship-Based Approaches*  
21  
22 *That Reduce Stress, Build Resilience and Support Healing in Young Children*. Taylor  
23  
24 & Francis.

25  
26 O’Toole, Catriona, and Mira Dobutowitsch. 2023. “The Courage to Care: Teacher  
27  
28 Compassion Predicts More Positive Attitudes Toward Trauma-Informed Practice”.

29  
30 *Journal of Child and Adolescent Trauma*. 16:123-133.

31  
32 <https://doi.org/10.1007?s40653-022-00486-x>

33  
34 Overstreet, Stacy, and Sandra M. Chafouleas. 2016. “Trauma-Informed Schools: Introduction  
35  
36 to the Special Issue.” *School Mental Health* 8 (1): 1–  
37  
38 6. <https://doi.org/10.1007/s12310-016-9184-1>.

39  
40 Perry, Bruce D. 2009. “Examining Child Maltreatment through a Neurodevelopmental Lens:  
41  
42 Clinical Applications of the Neurosequential Model of Therapeutics.” *Journal of Loss*  
43  
44 *& Trauma* 14 (4): 240–55. <https://doi.org/10.1080/15325020903004350>.

45  
46 Perry, Bruce, and Maia Szalavitz. 2017. *The boy who was raised as a dog: And other stories*  
47  
48 *from a child psychiatrist’s notebook - what traumatized children can teach us about*  
49  
50 *loss, love, and healing*. Basic books.

1  
2  
3  
4 Phillips, Bernadette, Catriona O’Toole, Sinéad McGilloway, and Stephen Phillips. 2022.

5  
6 “Montessori, the White Cross and Trauma-Informed Practice.” *Journal of Montessori*  
7  
8 *Research* 8 (1). <https://doi.org/10.17161/jomr.v8i1.15767>.  
9

10 Phillips, Bernadette. 2022. “Montessori Method, and the Neurosequential Model in Education  
11  
12 (NME).” *Journal of Montessori Research* 8 (2): 33–  
13  
14 43. <https://doi.org/10.17161/jomr.v8i2.18419>.  
15

16  
17 Povell, Phyllis. 2010. *Montessori Comes to America: The Leadership of Maria Montessori*  
18  
19 *and Nancy McCormick Rambusch*.  
20

21 Radice, Sheila. 1920. *The New Children*.  
22

23 SAMSHA (Substance Abuse and Mental Health Services Administration). 2014. *SAMHSA’s*  
24  
25 *Concept of Trauma and Guidance for a Trauma-Informed Approach*. Rockville, MD:  
26  
27 Substance Abuse and Mental Health Services Administration.  
28

29 Stenhouse, Laurence. 1988. Case study methods. In John. P. Keeves (ed.) *Educational*  
30  
31 *Research, Methodology, and Measurement: an International Handbook*, 1<sup>st</sup> edn.  
32  
33 Oxford: Pergamon Press, Sidney, 49-53.  
34

35  
36 Thomas, M. Shelley, Shantel D. Crosby, and Judi Vanderhaar. 2019. “Trauma-Informed  
37  
38 Practices in Schools Across Two Decades: An Interdisciplinary Review of  
39  
40 Research.” *Review of Research in Education* 43 (1): 422–  
41  
42 52. <https://doi.org/10.3102/0091732x18821123>.  
43

44 Thomas, G. 2021. *How to do your Case Study*. Sage.  
45

46 United Nations Convention on the Rights of the Child. UNCRC. 1989.  
47

48 Van Der Kolk, Bessel. 2014. *The Body Keeps the Score: Mind, Brain and Body in the*  
49  
50 *Transformation of Trauma*. Penguin UK.  
51  
52  
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Table 1: Overview of Programme Content

<b>Table 1: Overview of the programme</b>	
<b>Session 1</b>	<b>Historical approaches to TIP - Montessori</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• Brief introduction to Dr. Maria Montessori</li> <li>• Montessori's work with trauma affected children</li> <li>• Montessori's approach to healing trauma affected children</li> </ul>
<b>Session 2</b>	<b>Trauma</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is trauma?</li> <li>• Trauma Versus Stress</li> <li>• The Stress Response</li> <li>• Survival Strategies - hyper and hypo - arousal</li> <li>• The window of tolerance</li> <li>• The Polyvagal Theory</li> <li>• The PACE model</li> </ul>
<b>Session 3</b>	<b>Trauma Informed Practice</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• What is TIP</li> <li>• The 6 core principles of TIP (SAMSHA 2014)</li> <li>• The 4 main assumptions of TIP (SAMSHA 2014)</li> </ul>
<b>Session 4</b>	<b>TIP in Contemporary Early Childhood Settings</b>
Duration: 5 Hours	<ul style="list-style-type: none"> <li>• How to incorporate the 6 TIP principles in contemporary Early Childhood Settings</li> <li>• How to incorporate the TIP assumptions in Early Childhood Settings</li> <li>• How to incorporate the TSP in contemporary Early Childhood Settings</li> </ul>