Applied Behaviour Analysis versus Positive Behaviour Support:

Using an Implicit Measure (IRAP) to evaluate influence of

terminology on Social Acceptance

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Abstract

Study 1 examined whether terminology affected naive college participants' (*N*=60) implicit and explicit rating evaluations of Applied Behaviour Analysis (ABA) and Positive Behaviour Support (PBS) when both described similarly as educational supports. Participants were then divided into two groups and exposed to an intervention that delivered expanded positive information about ABA or PBS, and evaluation measures were repeated post-intervention to determine if positive evaluations increased; however results showed that terminology was not shown to exert influence. Malleability was found with explicit but not implicit data, and both groups showed increased positive evaluations towards the relevant support regime. Study 2 used similar explicit and implicit measures with ABA professionals and students (*N*=40). Pre and post measures were taken regarding an intervention with positive information about PBS. Results showed that positive information about PBS failed to impact preferential evaluations for ABA that were evident in both explicit and implicit measures pre and post intervention. Findings are discussed regarding ABA dissemination issues, and malleability of explicit and implicit responding.

Chapter 1

Introduction

Applied Behaviour Analysis versus Positive Behaviour Support: Using an

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Acceptance

Behaviour analysis, or the science of behaviour (Skinner, 1938; 1953; 1967), is largely focused on behaviour that is objectively measurable rather than subjective phenomena, however, as a social science Applied Behaviour Analysis (ABA) must also rely on subjective evaluations and acceptance of the wider social community, or else ultimately fail because of redundancy (Wolf, 1978). In order to assess social acceptance, measurement systems have been developed for the wider community to give feedback about ABA interventions used to increase or decrease behaviour. Wolf highlighted that this is not inconsistent with Skinner's fundamental scientific views but is part of the evolution of ABA as an applied social science that requires uptake within the community to survive. An important and defining dimension of ABA is its application to socially significant and behaviour resulting in meaningful changes (Baer, Wolf & Risley, 1968; 1987). Therefore Wolf's recommendation toward measuring social validity (social acceptance) of ABA by consumers of interventions became traditional (Hayes, Rincover & Solnick, 1980). In other words, applied behaviour analysts examine what is worth doing, what are the behaviour goals and how these behaviour goals can be targeted and achieved using methods that are acceptable to the social community (Fawcett, 1991; Cooper, Heron & Heward, 2007). An example of a socially significant behaviour is teaching an individual how to read, whereas an example of a behaviour that would be deemed as socially unacceptable is teaching an Alzheimer's patient the history of presidents in a country. The latter does not have a direct positive effect on the individual's life (i.e., no meaningful change) in comparison to teaching an individual how to read (Cooper

et al). Behaviour analysts are very aware of what may, or may not, be deemed as socially acceptable goals and methods in the wider community when intervening to produce behaviour change with individuals or groups. Related to social acceptance in the wider community, is the question as to whether the terminology is too scientific and thus off-putting to lay consumers has been considered in discussions regarding the lack of widespread uptake of ABA interventions. In other words, the inability to understand the scientific "jargon" may lead to social disapproval of ABA and hinder its evolution as a social science.

Applied Behaviour Analysis

ABA is a science derived from the behaviour principles proposed by Skinner (1938, 1953, 1957) facilitating the design of science-based interventions and the application of these to a range of human situations, to increase adaptive behaviour and replace the function of problem behaviour. The ABA method focuses on analysing functional relationships between observable behaviour and the environmental context in which it occurs, which has helped to identify why behaviours occur, or the function of the behaviour (Wahler & Fox, 1981). By understanding the function of the behaviour for a given individual, it enables behaviour analysts to design and implement an effective intervention to help with behaviour change designed to enhance life experience. ABA tends to be applied to the behaviour change of an individual rather than of a group using single-subject methodology to implement interventions "tailored" for the needs of the specific individual (Johnston & Pennypacker, 2009).

There is currently approximately 40 to 50 years of scientific research in which ABA interventions have resulted in improvement in a variety of behaviour from physical aggression towards others to successful academic performance

(Wahler & Fox, 1981). The behavioural literature documents the benefits of applying ABA in various settings such as work environment (known as Performance Management or Organisational Behaviour Management; Daniels, 1989), education (Alberto & Troutman, 2003) and residential care units (Burgio & Borgeois, 1992). The application of behaviour principles has been shown to increase positive social behaviours such as communication skills (Lechango, Carr, Grow, Love & Almason, 2010; Periera, Delgado & Oblak, 2007), social interaction skills (Chan & O'Reilly, 2008) and self-sufficiency skills (Taber, Alberto, Seltzer & Hughes, 2003). Indeed to date, ABA has made a fundamental positive impact on social and academic deficits in the area of developmental disabilities, in particular with individuals with autism spectrum disorder (ASD) (see Matson, Benavidez, Stabinsky-Compton, Paclawskyji & Baglio, 1996. ASD was once associated with the intellectually gifted individuals (Cash, 1999) but in recent times it has been more so associated with atypical development and deficiencies in social and language skills. Indeed autism has been characterised by language and social difficulties, sensory issues, unique personalities and abilities, repetitive body movements and a restricted range of interests (American Psychiatric Association, 1994; Schreibman, 1988; Simpson, 2001). ABA has been deemed a valid scientific-based treatment method of intervention for problem behaviours that may arise with individuals with autism (see Larsson, 2005, 2013) that has also received support regarding social acceptability (Didden, Duker & Korzilius, 1996; Simpson, 2005; Peters-Scheffer, Didden, Korzilius & Sturmey, 2011).

Even outside of the field of behaviour analysis, applied behaviour interventions have been recommended as treatment of choice for children with autism and related problems (Larsson, 2013). For example, Larsson noted that the

New York, the Maine, and the US AHRQ commissions conducted a year-long independent review of the scientific support of all the possible interventions for autism. The findings showed that ABA-based therapies alone, of all possible treatments for children with autism, had been proven effective. Furthermore in 2005, Larsson highlighted long-term outcomes from Lovaas' early study. After 25 years and 400 research studies, Lovaas found that 47% of children diagnosed with autism received a diagnosis-reversal (i.e., no longer diagnosed with autism).

ABA can be successfully applied to behaviours in classroom settings with typically-developing children, which may become increasingly important (Everston & Weinston, 2006). As the concept of "inclusion" and tolerance of diverse student populations has been advocated internationally, teachers are frequently faced with the task of addressing problematic behaviours while also covering an educational curriculum with the class, which can result in job dissatisfaction and burnout (Houghton, Wheldall & Merrett, 1988). This is an area that could benefit by expertise in behavioural supports and interventions, however, despite the documented successes of ABA across several decades, widespread use has not resulted in areas such as "mainstream" classrooms, and in fact ABA is frequently exclusively associated with treating autism-related problems (Granpeesheh, Tarbox & Dixon, 2009). There have been several factors contributing to the lack of widespread uptake of ABA outside of the area of intellectual disability and autism, and one problem identified early by Skinner (1974) himself was that the terminology used may be unattractive to a lay population.

Scientific Terminology

The use of scientific terminology not readily understood by the community outside of behaviour analysis has long been thought as an impediment to social acceptance of ABA (Deitz & Arrington, 1983; O'Leary, 1984; Bailey, 1991, Lindsley, 1991; Skiba & Deno, 1991; Foxx, 1996). Thus a more sensitive approach is needed when using behavioural analytic terminology, as it has often resulted in confusion and misconceptions, for example, in Arntzen, Lokke, Lokke and Eilertsen's (2010) study. The findings replicated those of Lamal (1995) indicating that misconceptions related to terminology were found in all groups of university students and also in teachers from the university departments. There was no difference in the number of misconceptions between a control group (i.e., non-psychology students) and psychology students; however, the results from the students in the behaviour analysis masters programme indicated significantly fewer misconceptions in comparison to the other groups.

Deitz and Arrignton (1983) pointed out that the terminology used by behaviour analysts has been referred to as 'conceptual revision' (Harzem & Miles, 1978). Conceptual revision refers to either inventing a new word (e.g. operant) or using an existing word in a different way. The latter seems a prime candidate for causing confusion or misunderstanding, for example, "punishment" carries negative connotations in the wider community. The *Oxford Online Dictionary* defines punishment as "the infliction or imposition of a penalty as retribution for an offence, or rough treatment or handling" (http://www.oxforddictionaries.com/definition/english/punishment?q=punishment), whereas in behavioural terms it refers to the presentation (or removal) of a stimulus which may decrease the probability of the behaviour occurring in the future (Cooper

et al., 2007). Terms such as "punishment procedure" may be unattractive if not unacceptable to lay consumers of ABA, especially when vulnerable populations are being treated, however, as pointed out by Foxx (1985), in behavioural terms a kiss could be deemed as punishment for an individual as long as it results in a decrease of the target behaviour. It is of course desirable to have a precise scientific language to describe methods in a science of behaviour, however, it may nevertheless be possible to change terms in behaviour analysis such as "punishment" and "negative reinforcement" (another culprit) to convey accurate meaning with greater clarity.

Some have suggested that the scientific terminology be translated into language suited to the lay community; however this may further contribute to a perception that behaviour analysts are condescending (Swenson, 1990, in Lindsley, 1991). Due to the negativity surrounding the translation of the scientific terminology, Bailey (1991) suggested a need to market behaviour analysis in a catchy, unthreatening and user-friendly way. Marketing has not been valued by the behaviour analysis community as it does not meet the standards of the science, and as a result the development of socially acceptable terminology has been neglected. The behaviour analysis community did not study the consumer audience and thus failed to promote behaviour analysis as easy to use and socially acceptable. Competitors such as Positive Behaviour Support, however, use attractive and appealing language (Foxx, 1996) so that PBS has become much more accepted in the wider community.

PBS uses a more value-centred approach in its terminology (APBS, 2007), for example, reoccurring terms within the PBS field are "person-centred" and "quality of life". Such terms create positive connotations and instantly suggest to the wider community that the values of the individual are central to all interventions.

PBS primarily aims to change antecedent stimuli such as the environment rather than analysing the consequences of behaviour (Anderson & Freeman, 2000; Horner, 2000) and is described as "preventative", which may be appealing also. Johnston, Foxx, Jacobson, Green and Mulick (2006) noted that the term "Positive Behaviour Support" subtly implies that it is both positive and supportive to individuals that exhibit problem behaviour; unlike the methods it replaces (i.e., ABA). Thus, it may be that the global term, "applied behaviour analysis", covering a range of treatment interventions, is unattractive to the wider community, which could be very important to widespread uptake. Many ABA interventions have investigated social acceptability of outcomes and procedures; however, the acceptability of the global term "applied behaviour analysis" as a treatment has not received much attention. Preliminary data in a recent study conducted in an Irish context suggested that participants (N=270) rated ABA less favourably compared to PBS, despite that PBS has hardly gained a foothold within this jurisdiction compared with ABA supports (Best, Murphy, Barnes-Holmes & Barnes-Holmes, unpublished thesis). A possibility was that these findings were related to terminology, in that "applied behaviour analysis" was a less attractive term than "positive behaviour support", and this exerted an influence on participant ratings but this remains speculative and needs to be investigated.

ABA and Aversive Procedures

Since early days, there has been a constant theme of misconceptions of behaviour analysis (Foxx, 1996). Foxx replicated findings of O'Leary (1984) from a mini meta-analysis of reviews from The New York Times Index 1970 to 1994. In the review, a total of 51 behaviour analysis articles were rated as either positive or negative; 71% were rated negative and 29% were rated positive. Foxx suggested

possible explanations, not all of which are related to terminology: (1) the negative early history of behaviour analysis still affects the modern image of ABA, (2) the portrayal of treatment, or intervention, packages, (3) the terminology which is reportedly unattractive to lay communities, and consequently (4) the need to educate the wider community in a universal language.

Regarding (1), unfortunately there appears to be a haunting association of ABA with punishing or aversive treatments by populations outside the field, due in part to historical problems such as the Sunland Miami scandal (Bailey & Burch, 2013). An abuse investigation took place in the Sunland Training Centre in Miami in 1972. The Blue Ribbon Committee charged with investigations conducted interviews with over 70 individuals, including current staff members, former employees, residents and relatives of residents - some extensive interviews lasted up to ten hours. In addition, logs, internal memoranda, personal diaries and personnel records were examined. They found that under the direction of the on-site psychologist, who self-proclaimed to be an expert in behaviour modification, a "treatment" programme was established for problem behaviour which consisted of many abusive regimes towards the residents. These included the following: forced public masturbation (for those caught masturbating), forced washing of the mouth with soap (for lying, abusive language or in some cases simply speaking at all), excessive use of restraints; for example, one resident was restrained for over 24 hours and another resident was forced to sit in a bath for 48 hours. Instead of using restraints as a preventive strategy for self-injury, the restraints were routinely used as punishment. Importantly, it turned out that the on-site psychologist (head of the programme) had in fact no formal qualification or training in behaviour analysis. In addition to these shameful discoveries, the issue of aversive treatments and early behaviour modification programmes was complicated

by general confusion in that many aversive and abusive procedures were described as behavioural treatments when in fact they were entirely unrelated to behavioural methods, for example, electroconvulsive therapy and insulin shock therapy. The Sunland Miami scandal resulted in behaviour analysts establishing ethical standards to guide practitioners and researchers alike, so that such heinous abuses of vulnerable populations might be prevented, and the Behaviour Analyst Certification Board (BACB) was set up with this initial purpose. Current ethical recommendations for behaviour analysts are that positive reinforcement is the treatment of choice or "default" treatment in ABA and punishment should only be used in exceptional cases and subsequent to documented evidence of previous attempts with positive reinforcement. In fact, this accords with Skinner's (1953) recommendations from the outset that positive reinforcement was preferable to aversive procedures due to problematic negative side effects as well as moral and humane considerations [see also Sidman (1993) regarding problems in relation to coercive treatments].

Perhaps in an attempt to dispel negative associations between ABA and aversive treatments in the wider community, a movement known as Positive Behaviour Support (PBS) emerged in the 1960's, with a pre-stated mission to use only positive behavioural interventions and to shun the use of "aversive" procedures in the treatment of individuals and groups with intellectual disability (Bailey, 1991; Lindsley, 1991, Arntzen et al., 2010).

Positive Behaviour Support

PBS emerged at the time of controversial issues surrounding aversive interventions with individuals with developmental disorders (Johnston et al., 2006) and was described as a broad-based behaviour movement in support of non-aversive behaviour procedures (Horner et al., 1990). The term Positive Behaviour Support

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was coined because it was fundamental to highlight the use of non-aversive

procedures to the near exclusion of aversive procedures. PBS involves the

rearrangement of the environment (antecedent intervention) in order to decrease the

probability of problem behaviours occurring and increase the probability of social,

personal and professional quality in individuals' lives (Anderson & Freeman, 2000;

Horner, 2000).

In addition to constantly highlighting the use of non-aversive procedures,

Horner et al. (1990) also pointed out that PBS did not involve a specific technique

but a combination of behavioural techniques and theories that are used in ABA also.

Such techniques and theories included functional analysis, antecedent manipulations

such as environmental changes, multi-component interventions, manipulation of

ecological and setting events, teaching adaptive behaviour and lifestyle change

(Horner et al). Unlike ABA, however, PBS does not restrict behaviour change

interventions for use in single-subject or small *n* experimental designs. PBS tends to

use a whole-class, or whole-school, approach, and only occasionally an individual

approach, and identifies and adopts the use of effective policies, practices, systems

and data driven based decisions (Sugai et al., 2000). The teaching support identifies

predictable patterns in behaviour on the basis that if behaviour can be predicted it

can also be prevented (Scott, Park, Swain-Bradway & Landers, 2007). The school-

wide positive behaviour support (SWPBS) acts as a systems perspective and

provides a continuum of behaviour support. SWPBS helps to establish a social

culture in which both social and academic success is more likely achievable and it is

preventative of problem behaviours (Horner, Sugai, Todd & Lewis-Palmer, 2005;

Sugai, 2007). In order to create the positive school culture, PBS encompasses three

elements; a common language used by all students and staff, an understanding of

behavioural expectations by all students and staff, and common values by all students and staff. Perhaps one of the most important and significant elements in PBS is that it aims to explicitly teach the behavioural expectations. For all students and staff, the behaviour is defined, the rationale for the behaviour is explained, discrimination between appropriate behaviour and inappropriate behaviour is taught, and if applicable, a signal for a target behaviour is taught and when the appropriate behaviour occurs it is reinforced (Horner et al., 2005).

The intervention continuum in PBS is comprised of three different intensive layers of treatment (Sugai, 2007); this is frequently represented visually with a triangle (see Figure 1).
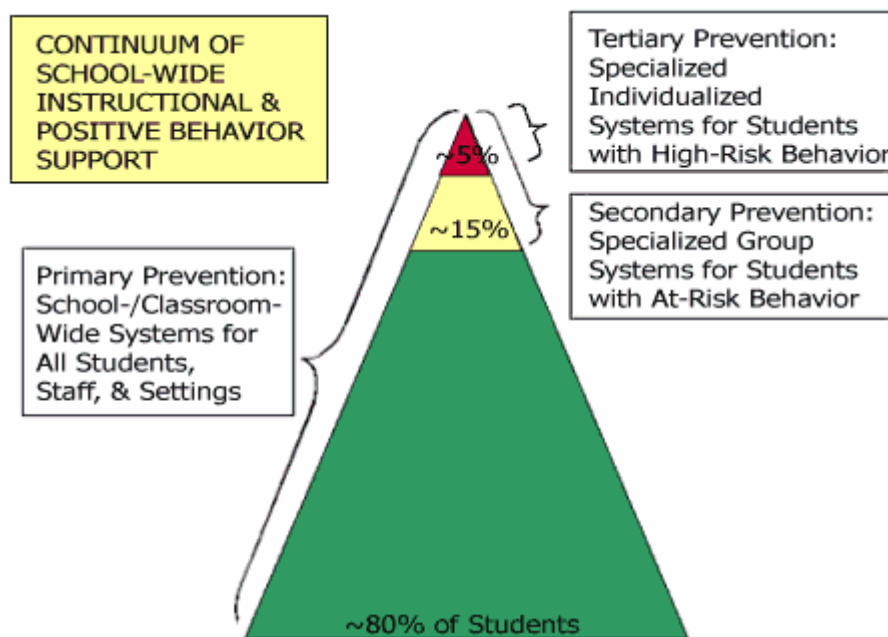

Figure 1. Continuum of Positive Behaviour Support. Source https://www.indianriverschools.org/SiteDirectory/Curriculum/PBS/Pages/TiersofIntervention.aspx

The triangle consists of three overlapping tiers, each representing a continuum of interventions that increase in individualisation and specialisation based

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on the responses of the behaving learner. The first tier or the primary prevention tier, located at the bottom of the triangle, consists of school-wide teaching for all individuals, for example, specific social behaviour such as the hand washing routine. The second tier or secondary prevention tier consists of intensive interventions, such as small-group teaching or behavioural contracts, for students with "at-risk" behaviour. The third tier or tertiary prevention tier consists of specialised individualised interventions for students with "high-risk" behaviour. The use of the three-tiered prevention triangle acts as a guide to organise behavioural interventions based on the responses of the individual.

PBS and Widespread Uptake

Unlike ABA from which PBS was derived, the latter has garnered support from federal agencies which may have helped secure the social acceptance amongst the wider community. For example, PBS is represented at Special Education and Developmental Disabilities conferences (Johnston et al., 2006). An international organisation, Association for PBS (APBS), was founded to expand application of the PBS approach with all individuals with problem behaviour regardless of age. PBS was recognised in the Individuals with Disabilities Education Act (1997, in Johnston et al.) as it is consistent with the act for specifically highlighting the use of non-aversive procedures. In addition to the support gained from political groups, the PBS model is perhaps more marketable than ABA as (1) it aims to intervene with groups rather than individuals, (2) it analyses the antecedent stimuli rather than focusing on consequences (preventative), and (3) teaches behavioural expectations (Horner et al., 2005) which gives a clear distinction between what behaviour will gain reinforcement and what behaviour will not. These features may be attractive to funding agencies that are interested in interventions that can be implemented at a

group level and are not perceived to be as costly as one-to-one intervention. This may be a factor in the much more widespread use of PBS compared to ABA (Bailey, 1991). Also related to the cost of interventions, to date there are no university-level courses in PBS, whereas university level training and the development of considerable expertise is required to qualify as a practitioner in ABA (BACB). The expertise required of practitioners in PBS may require some clarification; however, a Board Certified Behaviour Analyst (BCBA) qualified practitioner could presumably supervise the delivery of PBS interventions by individuals with lower levels of training or expertise.

What is the Difference Between ABA and PBS?

Johnston et al. (2006) have questioned what is the difference or the relationship PBS has to ABA. PBS and ABA share similar elements (i.e., functional analysis, antecedent manipulations etc.) perhaps due to the founders being trained in ABA. Carr et al. (2002) described ABA methods as rigid and impeding in application, whereas PBS is proactive and does not rely on the use of aversive procedures unlike the traditional methods. Carr et al's comparison may appear to be a subtle hint towards ABAs distant past. However, both methods do focus on identifying why behaviour occurs and teaching alternative socially appropriate behaviour. PBS uses the same behavioural analytic procedures as ABA so it has become apparent that PBS must be doing something different as it has become more acceptable in the wider community.

Often PBS has been marketed as a new science which has evolved from ABA (Carr, 1997) implying that ABA is less advanced as PBS (Johnston et al., 2006), however, Horner (2000) stated that there is no difference between both methods and that PBS is more like a branch of ABA. Johnston et al. suggested that by utilising the

brand name effect and remarketing ABA as PBS resulted in a user-friendly appearance. The result of the brand name effect has led to greater social acceptance in the wider community particularly in education and developmental disabilities. Unfortunately as noted by Johnston et al. this may have simultaneously hindered the further acceptance of ABA in the wider community.

Explicit and Implicit Evaluations

It may be the user-friendly terminology in PBS that has facilitated popularity among the wider community compared to the scientific terminology used in ABA (Johnston et al., 2006). As discussed PBS has utilised a positive brand name effect and does not consistently use scientific terminology. As mentioned Best et al. (unpublished thesis) found that ABA was rated less favourably than PBS using explicit self-report measures. Explicit self-report measures, such as questionnaires, behaviour rating scales and Likert-scales, are a traditional method of assessing implicit attitudes. Implicit attitudes, or evaluations, are defined as "introspectively unidentified (or inaccurately identified) traces of past experience that mediate favourable or unfavourable feelings, thoughts or actions toward social objects" (Greenwald & Banaji, 1995, p. 8).

There is on-going debate as to how explicit and implicit evaluations operate and influence behaviour (e.g., Gawronski & Bodenhausen, 2006; Rydell & McConnell, 2006; Wilson, Lindsey, & Schooler, 2000. Nosek (2005) suggested that both these evaluations are "related but distinct constructs". It has appeared that self-report measures (i.e., explicit measures) predict intentional and controlled behaviours (e.g. Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Dovidio, Kawakami, Smoak, & Gaertner, 2009), whereas implicit measures tend to reveal spontaneous, immediate responses and judgement (Freise, Hofmann, & Wanke, 2008; Galdi,

Arcuri, & Gawronski, 2008; McConnell & Leibold, 2001). The latter has become essential to investigate due to the ability of these evaluations to guide behaviour (Greenwald & Banaji, 1995). Self-report measures have been noted as being susceptible to self-presentational strategies and result in an inaccurate reflection of implicit evaluations (de Jong, 2002; de Jong et al., 2002; Gemar, Segal, Sagrati & Kennedy, 2001).

The Implicit Association Test

The Implicit Association Test (IAT; Greenwald, McGhee & Schwartz, 1998) is one of the most common and established methods of assessing implicit evaluations. The IAT has been described as a computer response task where participants must categorise four types of stimuli by using two response keys (Olson & Fazio, 2001). The IAT has been commonly used to measure existing attitudes including sensitive issues such as racial prejudice (see Experiment 3 in Greenwald et al.). Recent research has utilised the IAT to examine the formation and malleability of implicit evaluations with an emphasis on indicators of newly-established attitudes (DeHouwer, Beckers & Moors, 2007). Gregg, Banaji and Seibt (2006) conducted a study to investigate the formation and malleability of evaluations towards two fictitious social groups; the Niffites and the Luupites. Participants read narratives about both social groups. One group was described as positive (i.e., good, peaceful and honest) and the other was described as negative (i.e., bad, dangerous and dishonest). Participants completed the IAT trials and the results showed positive attitudes towards the group conveyed as positive and negative attitudes were recorded towards the group conveyed as negative. These findings suggested that the formation of implicit attitudes can be due to supposition, and perhaps can be malleable (DeHouwer et al., 2007). Even though the IAT is one of the most

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commonly used measures of implicit attitudes, there are some limitations such as
demand effect (DeHouwer, 2006) and that associations are formed, not relations
between stimuli (Barnes-Holmes et al., 2006).

Behavioural Approach to Implicit Attitudes

In order to accurately assess implicit evaluations, alternative assessment tools
have been used such as the Implicit Relational Assessment Procedure (IRAP;
Barnes-Holmes et al., 2006). The IRAP was developed from relational frame theory
(RFT; see Hayes, Barnes-Holmes & Roche, 2001), a modern behavioural theory of
human cognition and language. It is important to outline how behaviour analysis led
to RFT and to a behavioural approach to implicit evaluations using the IRAP [i.e.,
the IRAP origins such as Relational Evaluation Procedure (REP; Barnes-Holmes,
Healy & Hayes, 2000; Hayes & Barnes, 1994)].

Verbal behaviour. Skinner's (1957) work on verbal behaviour has been seen
as a pivotal turn in behaviour analysis and been described as a "distinguishing
feature of the human behavioural repertoire" (Cooper et al., 2007, p. 525). It was
with Skinner's conceptual analysis of verbal behaviour that interventions began to
focus and incorporate the verbal behaviour repertoire, in particular with individuals
with developmental disabilities (see Sundberg & Michael, 2001). As Skinner
described language as a function rather than emphasising structure, it caused a stir
amongst cognitive psychologists. Some argued language is controlled by internal
cognitive processes such as accepting, classifying, coding, encoding and storing
verbal information (e.g. Bloom, 1970; Piaget, 1952) and some argued that language
is innate (see Chomsky, 1965). In recent times, behavioural psychologists have
addressed the arguments against Skinner's verbal behaviour by an account of
complex language derived from the behavioural literature on stimulus equivalence

and derived relational responding with proposing RFT (Barnes-Holmes, Barnes-Holmes & Cullinan, 2000; see Hayes et al., 2001).

Relational frame theory. In the early 1970s, Sidman embarked on developing methods to examine stimulus equivalence which describes responding to non-reinforced stimulus-stimulus relations subsequent to reinforced responses to some stimulus-stimulus relations (Cooper et al., 2007). The early research in stimulus equivalence revealed an applied advantage of teaching reading to individuals with developmental disabilities. In later years, it became apparent of the conceptual implications and acknowledgement of the methods used (Barnes-Holmes, Barnes-Holmes, Smeets, Cullinan & Leader, 2004). The research suggested that stimulus equivalence could provide a behavioural account of language (Sidman, 1994). For example, Barnes (1994) identified areas of research which showed support for the link between language and behaviour. Furthermore, Barnes-Holmes et al. supported this view by suggesting that

"the correlation between verbal abilities and equivalence relations occurs because both are forms of the same general behavioural activity. If the two areas do overlap at the level of behavioural process, then questions about human language may also be questions about derived stimulus relations, and vice versa" (p.187).

This has been the primary view to RFT research in the past 15 years (see Hayes et al., 2001). According to RFT, verbal behaviour involves a history of reinforcement for responding in a range of contextually controlled and arbitrarily applicable relations known as relational frames. Furthermore, RFT supports derived relational responding and how it is established by a history of multiple-exemplar training (Barnes-Holmes et al., 2000).

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Early studies of stimulus equivalence and derived stimulus relations involved training and testing for laboratory-induced equivalence classes (Barnes-Holmes, Barnes-Holmes, Stewart & Boles, 2010). It was predicted that these laboratory-induced equivalence classes would be difficult to find due to natural verbal relations. The first study in this area looked at sectarianism in Northern Ireland with a sample of residents from Northern Ireland and English participants who did not reside in Northern Ireland (Watt, Keenan, Barnes & Cairns, 1991). In Northern Ireland, the verbal community tend to categorise family names and symbols with either the Catholic or Protestant religion (Cairns, 1984), however this verbal categorisation is rarely found in England. The initial stage in Watt et al's study consisted of training the matching of Catholic family names to nonsense syllables and the same nonsense syllables to Protestant symbols. All participants successfully completed this stage, but the next stage conveyed difficulty for the Northern Ireland participants. In the critical equivalence test, participants were asked to match Catholic family names with Protestant symbols and resulted in many Northern Ireland participants failing, but the English participants did not. The results suggested that the verbal relations already established by the Northern Ireland participants disrupted the formation of laboratory-induced equivalence relations. This basic effect has been replicated in various domains, such as academic self-concept (Barnes, Lawlor, Smeets & Roche, 1996), clinical anxiety (Leslie et al., 1993) and self-esteem (Merwin & Wilson, 2005). By putting natural verbal relation against laboratory-induced equivalence classes, it provided the conceptual foundation for developing the IRAP.

Implicit Relational Assessment Procedure (IRAP)

The IRAP drew heavily on the earlier work of the Relational Evaluation Procedure (REP; Barnes-Holmes et al., 2000; Hayes & Barnes, 1994). The REP presents participants with a task in which they must evaluate, or report on, the stimulus relation that is presented on a given trial (Barnes-Holmes et al., 2006; Barnes et al., 2010). The REP provided the methodological basis for the IRAP, as the IRAP involves presenting relational terms to participants in order for relations among the relevant stimuli to be assessed. The IRAP is a computer-based programme which requires participants to respond rapidly and accurately while being consistent or inconsistent with verbal relations, unlike the REP as there was no time criterion to meet (Barnes-Holmes, Hayden, Barnes-Holmes & Stewart, 2008). Latencies are then measured to assess the established relations between sample and target stimuli (McKenna, Barnes-Holmes, Barnes-Holmes & Stewart, 2007).The hypothesis for the IRAP is that average response latencies should be shorter across blocks of consistent to inconsistent trials (Barnes-Holmes et al., 2006). The hypothesis was formed due to the understanding that in the consistent trials participants will give the most probable response and correct key-pressing function, whereas in the inconsistent trials participants must respond in the opposite to what was the original immediate response which results in slower latencies (i.e., the IRAP bias). It was believed that participants would respond to the relational tasks which would mirror their actual implicit attitudes (Power, Barnes-Holmes, Barnes-Holmes & Stewart, 2009).

The IRAP effect has been consistently produced in IRAP studies and was first conveyed in Barnes-Holmes et al's (2006) preliminary studies which included implicit evaluations towards sensitive issues such racial prejudice. Studies have

identified that the IRAP results may not always correlate with the results of explicit measures due to the social sensitivity of the research topic. For example, Barnes-Holmes, Murphy, Barnes-Holmes and Stewart's (2010) study found a negative IRAP effect towards black people but a positive effect towards black people on explicit measures. In order to try and explain the difference of responding using explicit and implicit measures, the relational elaboration and coherence (REC) model has been suggested (Barnes-Holmes, Barnes-Holmes et al., 2010). According to the REC model, the IRAP trials may produce an immediate relational response before the participant responds by pressing the response key. This initial response may be determined by the verbal and nonverbal history of the participant and current contextual variables. By definition, the immediate response will be emitted first, thus the IRAP trial that requires a key press coordinating with the immediate response will be emitted quickly. However, an IRAP trial which opposes the immediate relational response may be emitted at a slightly slower rate. So across multiple IRAP trials, the average latency for inconsistent trials will be slightly longer than for consistent trials. In brief, the IRAP effect is based on immediate and relational responding when the behaviour system is put under pressure to respond quickly and accurately.

Regarding the difference in scores on explicit and implicit measures, the REC model suggests that self-report measures may reflect relatively elaborate and coherent relational responding (Barnes-Holmes et al., 2010). In other words, when individuals were asked to express an attitude without time constraints, this may facilitate participants responding with intentional control and deliberation that may involve complex relational responding (see Barnes-Holmes, Hayes & Dymond, 2001). However during the IRAP, there is very little time to engage in elaborated

relational responding due to the time constraints to respond. Thus, the IRAP allows the researcher to examine spontaneous and automatic evaluations whereas the explicit measures allow for more considered evaluations. The REC model also accounts for divergence between implicit and explicit measures, often found with sensitive issues. The model states that immediate or automatic evaluative responses may or may not cohere with subsequent relational responding; when they cohere, convergence will occur between implicit and explicit measures, but when they do not cohere, divergence will occur between the measures (Barnes-Holmes et al., 2010).

Previous Research

There is a continuing body of research utilising the IRAP to investigate various implicit attitudes, but in the current context the research of interest was Best et al's (unpublished thesis) pilot study. As previously mentioned, implicit evaluations towards ABA and other treatments were assessed using the IRAP with professionals in Ireland. Participants completed both self-report measures and the IRAP to examine initial bias towards ABA and other treatments. Subsequent to an information intervention in the form of a DVD displaying ABA as an effective treatment method, participants completed both a second self-report measure and IRAP to investigate whether explicit and implicit evaluations changed towards ABA. The results showed that pre-DVD there was a positive bias towards both ABA and other treatments but post-DVD there was an increase in positive bias toward ABA.

Another interesting aspect of findings in Best et al. found that participants rated PBS as a more effective intervention than ABA in a mainstream school in a questionnaire. Participants consisted of clinical professionals, applied professionals, and parents of children with various learning disabilities. These data are very much of a preliminary stage however it may be speculated that that "Applied Behaviour

Analysis" was a less attractive term than "Positive Behaviour Support" as suggested by Foxx (1996).

Current Research

The current research aims to further explore the issue and to replicate findings that a brief positive information intervention would change positive bias toward ABA. Specifically, the current research aims to examine whether terminology affect participant evaluations; if PBS is more attractive than ABA then with similar brief positive descriptions participants may show a preference for PBS. If a brief positive information intervention increases positive bias would the effect be greater for PBS than ABA indicating effect of terminology. In this way the research will also examine malleability of participant responding during both implicit and explicit measures.

Study 1. The first study consisted of 60 adult participants outside the field of ABA (i.e., no background in ABA). There were a total of 6 stages; (1) brief information about both ABA and PBS, (2) ABA and PBS questionnaires (pre-intervention), (3) IRAP evaluation (pre-intervention), (4) ABA and PBS expanded information (intervention), (5) ABA and PBS questionnaires (post-intervention) and (6) IRAP evaluation (post-intervention). In stage 2, participants were divided into two groups in which Group 1 received the ABA questionnaires only and Group 2 received the PBS questionnaires only. In stage 4, Group 1 received only expanded information about ABA and Group 2 received only expanded information about PBS. Stage 5 was similar to stage 2, as participants were divided again with Group 1 receiving ABA questionnaires and Group 2 receiving PBS questionnaires. It was hypothesised that participants would demonstrate a preference towards the term

Positive Behaviour Support rather than Applied Behaviour Analysis subsequent to both brief information and expanded information.

Study 2. The aim of Study 2 was to confirm that ABA instructors show preference for ABA versus PBS and to determine whether an intervention with positive information regarding PBS increased positive bias on evaluations of PBS. If ABA instructors did not show preference for ABA, particularly at the pre-intervention stage that would be very surprising and might suggest that terminology was indeed very powerful. Any impact of the positive information intervention on ABA instructors may be useful in terms of dissemination issues in ABA and malleability of implicit and, or, explicit responding.

Chapter 2

Study 1

Study 1

Examining the Effects ABA and PBS Terminology with the Individuals Outside of ABA Field

Introduction

As outlined in the Chapter 1, although more recent than ABA, PBS has been popular and successful use in the US (Johnston et al., 2006). ABA tends to use scientific terminology in its dissemination whereas PBS tends to use a more user-friendly approach. Behaviour analysts have shown concern about impact of scientific terminology on social acceptability and its potential future detriment to the field (Bailey; 1991; Lindsley, 1991). As mentioned, Best et al. (unpublished thesis) found that in limited information conditions participants outside the field of ABA (i.e., the wider community) reported PBS to be more effective than ABA in a mainstream school. Thus it may be that terminology was influential on preference shown. The current research is the first to date to investigate acceptability of ABA in global terms.

Method

Participants/ Setting

Study 1 involved 60 adult participants, females and males aged approximately 18-55, with no background history in ABA or PBS. In other words, participants were drawn from populations outside of the field. Most were non-psychology undergraduate college students who were recruited via posted advertisements on campus at National University of Ireland, Maynooth, and in local areas nearby the college. Data from six participants were excluded due to failure of achieving the predetermined performance criterion of 75% accuracy and 2000ms latency on the IRAP. Experimental procedures were conducted in the experimental

laboratory in the Department of Psychology at the National University of Ireland, Maynooth with a closed door in order to limit any noise disruptions or distractions. A small number of participants were accommodated in completing procedures in a quiet room convenient to the participant, for example at home.

Ethical Issues

All participation was voluntary and conducted with participants' informed consent. An information sheet and debriefing sheet was provided stating that confidentiality of participants' identities and that of the facility to which they were affiliated would be respected at all times and in any publication related to the research. A consent form was signed prior to the beginning of the research. In addition to these forms, additional information was collected about each participant such as age, occupation and familiarity with ABA and PBS. For copies of the information sheet, debriefing sheet, consent form and additional information sheet see Appendix 1. Participants were informed that data were analysed at group level and not at an individual level. In addition, participants were informed that data would be stored in an encrypted file and retained for the appropriate amount of time in accordance with legal requirements. An incentive was offered of participation in a raffle for a small prize (i.e., gift voucher), and all participants received a raffle ticket whether or not they completed all research procedures. The research was approved by the Ethics Committee at the Department of Psychology, NUI Maynooth.

Materials

Brief positive description information sheets for ABA and PBS. An A4 sheet with 16pt Times New Roman font described ABA as follows: "*APPLIED BEHAVIOUR ANALYSIS is effective in addressing problem behaviours for children. Educational and social skills are supported using ABA. The primary means to*

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establish new advantageous behaviour and reduce challenging behaviour is positive reinforcement (similar to reward systems); if possible, punishment is avoided or else used rarely". An A4 sheet with 16pt Times New Roman font described PBS as follows: "*Problem behaviour at school is effectively addressed using POSITIVE BEHAVIOUR SUPPORT. PBS can be used also to support educational and social skills. Positive reinforcement (similar to reward systems) is the primary means to establish new advantageous behaviour and reduce challenging behaviour; punishment is largely avoided but may apply in exceptional cases*". See Appendix 2 for copies of the brief information sheets.

Questionnaires for ABA and PBS. The questionnaires were Likert-type format, adapted from Best et al. (unpublished thesis) and a 4-point scale for rating agreement (i.e., agree strongly, agree somewhat, disagree somewhat and disagree strongly). There were six questionnaire statements and participants were asked to circle the rating that was most appropriate related to each statement (see Appendix 3). The ABA questionnaire presented statements such as "Applied Behaviour Analysis treatments are primarily based on positive reinforcement". The PBS questionnaire was similar except that it referred to PBS rather than ABA treatments, for example, participants were asked to rate their agreement with statements such as "Positive Behaviour Support treatments are primarily based on positive reinforcement".

Feeling Thermometers. A feeling thermometer (Dasgupta & Greenwald, 2001) was designed for rating participant "warmth" toward ABA and PBS treatments (see Appendix 4). The feeling thermometer consists of a statement and an image of a thermometer with a scale of 0-100 degrees. For the ABA feeling thermometer, the participant was asked to read the statement, "Please indicate on the

thermometer how warm you feel towards Applied Behaviour Analysis where 0°C is very cold and 100°C is very warm", and for the PBS version, the participant was asked to read the statement where 0°C is very cold and 100°C is very warm "Please indicate on the thermometer how warm you feel towards Positive Behaviour Support". In both cases, the participant subsequently ticked along the thermometer scale to indicate how warm they felt toward the teaching support.

Expanded positive information pamphlet (ABA and PBS). The positive information pamphlet provided a summary account of either ABA or PBS procedures but with much more detail than the brief information sheet (see Appendix 5 and 6). The positive information was identical in each pamphlet, except that one pamphlet described the procedures as ABA supports, and one pamphlet related the described procedures as PBS supports. Both pamphlets provided examples of the types of intervention that may be used in classrooms, highlighting important aspects such as positive reinforcement and functional behaviour assessment, and differences between ABA and PBS regimes were not reported.

Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al., 2009). The IRAP is a computerised program written in Visual 29 Basic (Version 6.0) and is freely available for download on the following website: http://irapresearch.org/. The programme was run on an Acer Aspire 7730 laptop. The IRAP programme controlled all aspects of stimulus presentation and the automatic recording of correct and incorrect participant responses, as well as the duration between onset of stimuli and the participant response. The IRAP presented stimuli in the form of trials within a series of blocks. The stimuli presented during the IRAP comprised of sample stimuli, target stimuli and response options as presented in Table 1. The sample stimuli consisted of the acronyms ABA and PBS which were

presented at the top of the screen. The target stimuli contained 12 evaluative terms; 6 positive (caring, effective, fantastic, beneficial, practical and supportive) and 6 negative (uncaring, useless, rubbish, unhelpful, impractical and overbearing). On each trial of the IRAP, one of the target stimuli was presented in the middle of the screen. The response options were two relational terms, "True" and "False", which were located at the bottom left and right hand corners of the screen. The response options alternated randomly between trials.

Table 1.
IRAP Stimuli

Positive Target Stimuli	Negative Target Stimuli
Fantastic	Rubbish
Caring	Uncaring
Effective	Useless
Beneficial	Unhelpful
Practical	Impractical
Supportive	Overbearing
Sample Stimulus	**Sample Stimulus**
ABA	PBS
Left Response Option	**Right Response Option**
True	False

Procedure

   General overview. After exposure to limited information about two support methods, namely ABA and PBS, participants were divided into two groups. Group 1 completed questionnaires related to ABA and Group 2 completed questionnaires related to PBS (see graphical outline of experimental procedures in Figure 2). Both groups then completed an IRAP procedure with alternating presentations of ABA/PBS with positive or negative stimuli. Group 1 was then exposed to a positive informative intervention that provided expanded information (i.e., pamphlet) about ABA, and Group 2 was exposed to a similar positive informative pamphlet about

PBS. The information was exact except that it was related to either ABA or PBS on the positive information pamphlets. Subsequently, the two groups completed the explicit and implicit procedures on a second occasion, to determine if the information provided to participants produced an effect on the resultant data compared to initial results with limited information. In summary, research questions were *a*) does terminology affect participant evaluations in limited information conditions (applied behaviour analysis versus positive behaviour support); *b*) does greater information affect implicit and or explicit evaluations (are implicit evaluations malleable)?; c) does terminology affect participant evaluations in expanded information conditions? (i.e., positive impact is greater for PBS than for ABA).

Study 1
Stage 1:
Brief Positive Information about both ABA and PBS (All participants *N*=60)

Stage 2:	
Group 1 (*n*=30) **ABA Rating Questionnaire and Feeling Thermometer (pre-intervention)**	Group 2 (*n*=30) **PBS Rating Questionnaire and Feeling Thermometer (pre-intervention)**

Stage 3:
IRAP evaluation ABA/PBS (pre-intervention) (All participants *N*=60)

Stage 4:	
Group 1 (*n*=30) **Expanded Positive Information Intervention ABA**	Group 2 (*n*=30) **Expanded Positive Information Intervention PBS**

Stage 5:	
Group 1 (*n*=30) **ABA Rating Questionnaire and Feeling Thermometer (post-intervention)**	Group 2 (*n*=30) **PBS Rating Questionnaire and Feeling Thermometer (post-intervention)**

Stage 6:
IRAP evaluations ABA/PBS (post-intervention) (All participants *N*=60)

Figure 2. Graphical representation of the procedure in Study 1

Stage 1: Brief positive information sheets. All participants (*N*=60) were
provided with brief positive information sheets for two educational supports,
Applied Behaviour Analysis and Positive Behaviour Support. The positive
information about both procedures was very similar but described in slightly
different wording, and participants were asked to read both sheets. The purpose of
keeping the information brief at this stage was to facilitate determining if
terminology impacted subsequent ratings of these procedures; for example, when

similar brief positive information is known about both regimes, it seems likely that any preference shown is related to the different terminology applied to the treatment regimes, namely "Applied Behaviour Analysis" versus "Positive Behaviour Support". It might be argued that the different words used to describe each of the procedures could have an influential effect; however, keeping the descriptions identical may have resulted in limited participant attention to whichever description was read secondly. Thus it was decided to use slightly different wording describing use of essentially the same principles, as it seems likely that the terminology incorporated in the formal description of the procedures (e.g., "Applied Behaviour Analysis" and "Positive Behaviour Support") would be more influential.

Stage 2: Exposure to explicit measures. After reading the brief positive information sheets regarding both ABA and PBS (full terms were used throughout the procedures except for the IRAP as the IRAP depends on speed and accuracy, however, the acronyms will be used in the current thesis for convenience and ease of reading), participants in Study 1 were divided into two groups. Group 1 was provided with questionnaires regarding ABA and Group 2 were provided with questionnaires regarding PBS. There were six questionnaire statements each with a 4-point Likert-type scale (i.e., Agree Strongly, Agree Somewhat, Disagree Somewhat and Disagree Strongly) on each questionnaire, and participants were asked to circle the rating that was most appropriate for them related to each statement. There was no "neutral" or "don't know" response option. This was because participants might be likely to select these options given the condition of limited information, whereas the current study aimed to examine evaluations that might be based largely on terminology, and therefore wished to encourage participants to rate the support regimes.

After completing the ABA or PBS questionnaires, the "Feeling Thermometer" rating procedure was presented to participants. The feeling thermometer consisted of a statement and an image of a thermometer with a scale of 0-100 degrees. Group 1 were presented with a feeling thermometer for ABA and Group 2 was presented with a feeling thermometer for PBS. For the ABA feeling thermometer, the participant was asked to read the statement, "*Please indicate on the thermometer how warm you feel towards Applied Behaviour Analysis where 0°C is very cold and 100°C is very warm*", and for the PBS version, the participant was asked to read the statement "*Please indicate on the thermometer how warm you feel towards Positive Behaviour Support where 0°C is very cold and 100°C is very warm*". In both cases, the participant subsequently ticked along the thermometer scale to indicate how warm they felt toward the teaching support. After completing the questionnaire and feeling thermometer with limited information, each participant progressed to stage 3.

Stage 3: Implicit Relational Assessment Procedure (IRAP). All participants completed the same IRAP procedure and participant data were given an identity code that also recorded whether they were provided with expanded information on ABA or PBS supports.

Prior to the IRAP, the Investigator explained to each participant the IRAP tasks that they would be required to complete. It was important that participants fully understood how to complete the program because this affects participant attrition rates; therefore the current study followed the instructions protocol provided on the IRAP webpage irapresearch.org, (see http://irapresearch.org/wp-content/uploads/2011/11/IRAP-2012-experimenters-script-v1.51.pdf) which has been found to facilitate reduced attrition rates. Before the procedure began, the

participant was asked if he or she understood what was expected and what to do to complete the IRAP. As is customary in IRAP research, each participant was informed that the practice blocks had to be successfully completed before progressing to the test blocks.

On each IRAP trial, four stimuli were presented at once on the computer screen; the sample stimulus (i.e., ABA or PBS), the target attribute in the centre (i.e., positive or negative words) and two response options, the words 'True' and 'False' at the bottom of the screen. The stimuli remained onscreen until the participant chose a response option by pressing either of the keys 'd' and 'k' on the keyboard. Participants were requested to rest their index fingers on these keys throughout the IRAP. The left-right positioning of the two onscreen response options alternated randomly across the trial-blocks. A correct response removed all the stimuli from the screen for a 400ms inter-trial interval before the next trial was shown. An incorrect response produced a red X immediately underneath the target word which remained onscreen until the correct response was emitted. When the correct response was emitted the IRAP trials continued.

If a participant failed to respond within 2000ms from the start of a trial the words "Too Slow" appeared under the target word and remained on the screen until a response (correct or incorrect) was emitted. The IRAP consisted of a maximum of four pairs of practice blocks and a fixed set of three pairs of test blocks, each consisting of 24 trials. Throughout each block, the 12 target words were presented in a quasi-random sequence, with each word appearing once with each type of sample stimulus. Thus the IRAP consisted of four different trial-types; *ABA-Positive, ABA-Negative; PBS-Positive; and PBS-Negative* (see Figure 3 for an illustrative

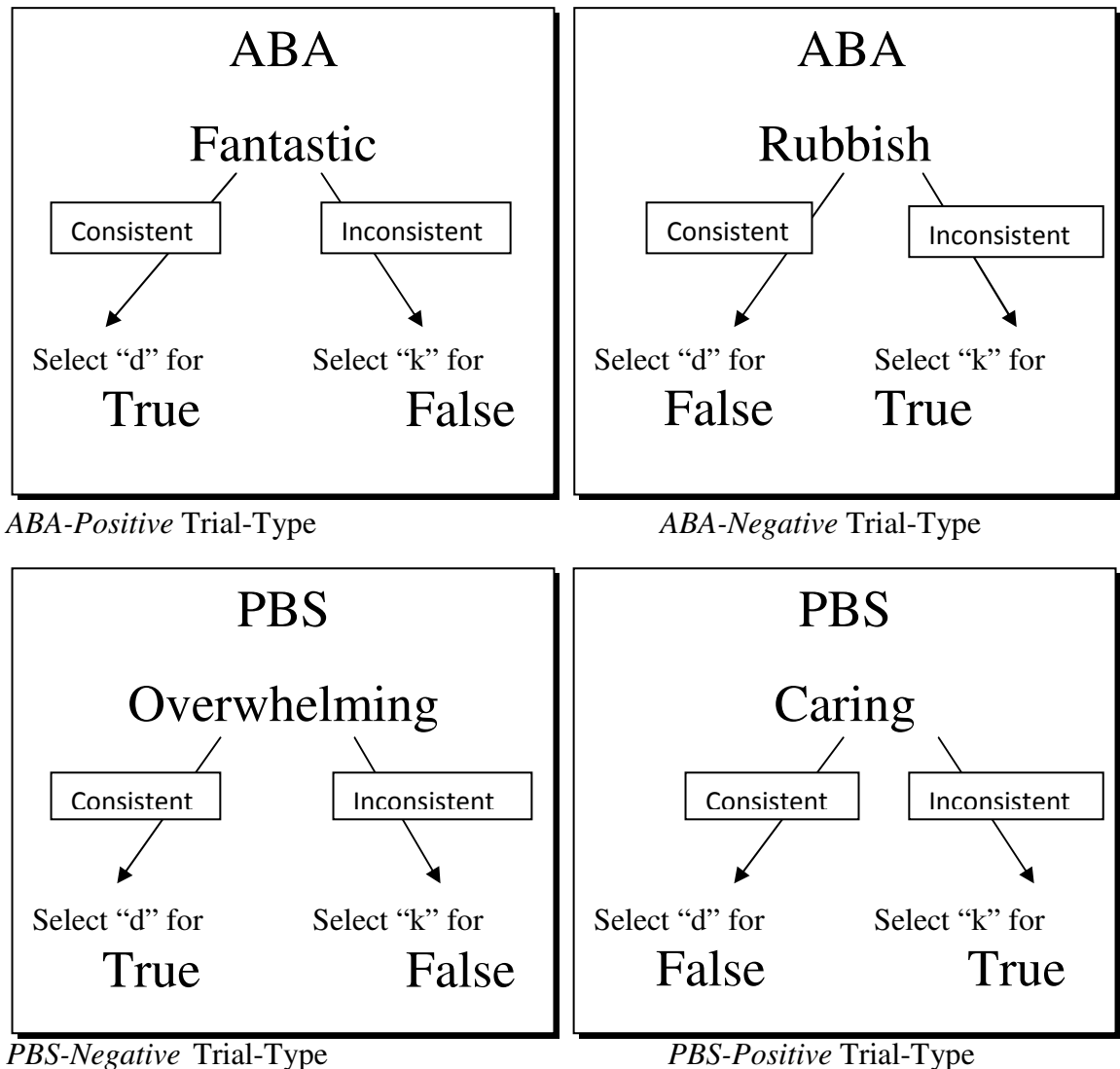example). The programme insured that the same trial-type was never presented twice across successive trials.

ABA **Fantastic** Consistent · Inconsistent Select "d" for · Select "k" for **True** · **False**	ABA **Rubbish** Consistent · Inconsistent Select "d" for · Select "k" for **False** · **True**
ABA-Positive Trial-Type	*ABA-Negative* Trial-Type
PBS **Overwhelming** Consistent · Inconsistent Select "d" for · Select "k" for **True** · **False**	PBS **Caring** Consistent · Inconsistent Select "d" for · Select "k" for **False** · **True**
PBS-Negative Trial-Type	*PBS-Positive* Trial-Type

Figure 3. Examples of the four IRAP trial-types. The target stimuli (ABA and PBS), sample stimuli (e.g. Fantastic or Rubbish), and response options ("True" or "False") appeared simultaneously on each trial. Arrows with superimposed text boxes indicate the responses deemed consistent or inconsistent. The arrows and text boxes did not appear on the screen.

For Groups 1 and 2, participants were required during consistent trial-blocks (24 trials per block) to emit responses consistent with *ABA-positive* and *PBS-negative* verbal relations, and during inconsistent trial-blocks to reverse these relations (e.g., *ABA-negative/PBS-positive*).During consistent trial-blocks, if the label stimulus ABA was presented onscreen with a positive target word such as 'fantastic', the designated correct response involved choosing the response option 'True', and selecting the "False" response option was designated incorrect. On the other hand, when the sample was PBS and the target word was positive during consistent trial-blocks, the designated correct response was 'False', and the response option 'True' was correct when PBS was presented with a negative target attribute. The completion of the 24 trials was followed by the presentation of feedback, which indicated the percentage of correct responses and the median response time in milliseconds for that block. Further information was then provided to participants that informed them that in the next block of trials, the previously correct and wrong answers would be reversed. Order of presentation of consistent and inconsistent trial-blocks was counterbalanced across all participants in Groups 1 and 2.

If participants were unsuccessful in achieving the required criteria in one or both practice blocks (i.e., 75% correct and < 2000 ms to respond), feedback informed them that they had to carry out the practice blocks again. If participants failed to reach the criteria after the fourth exposure to the pairs of practice blocks (i.e., eight blocks in total) text appeared on the screen indicating the end of the experiment. At this point, the participant was thanked and debriefed. If participants reached the required performance criteria for each of the two blocks, they commenced the test blocks. Information was presented onscreen to the effect that the participant was about to begin the test blocks. The three pairs of test blocks were

similar to the practice blocks, except that no performance criteria were required to continue through all six test blocks. However, accuracy and latency feedback data were presented at the end of each block to encourage participants to maintain both speed and accuracy. The end of the experiment was signalled by a blue a screen with the instruction *"Please notify the researcher"*.

Stage 4: Expanded positive information pamphlet ABA and PBS. After completing the IRAP, both Groups were presented with an expanded positive information pamphlet (i.e., Group 1 were presented with the ABA pamphlet and Group 2 were presented with the PBS pamphlet). Having read the pamphlet, participants were then asked to complete the explicit measures again.

Stage 5: Explicit measures. Participants received the same questionnaire with statements and feeling thermometer as before. This was to investigate whether participant responding showed malleability resulting from the context of expanded information - would participants exposed to greater information about ABA show preference for ABA, and would participants exposed to greater information about PBS show a preference for PBS? Another aim was to examine whether terminology had an effect on evaluations with expanded information, for example, would an increased preference shown for ABA, subsequent to a positive information intervention, be greater than an increased preference shown for PBS? After completing the explicit measures, participants progressed to the final stage of the research.

Stage 6: IRAP. Both groups were presented with the IRAP for a second time and followed the same procedure as outlined previously in Stage 3. This was to investigate effects of expanded positive information on participants' evaluations of implicit evaluations (i.e., did positive bias increase toward the relevant teaching

support). Changes in participants' responding resulting from contextual manipulation would also be interesting from the perspective of whether implicit responding is malleable. After completing the final stage, the participant was thanked and debriefed.

Interobserver Agreement

Interobserver agreement (IOA) for the explicit measures was assessed with an independent observer with a Masters in Maths. The questionnaires were assessed by using the score sheet as used by Best et al. (unpublished thesis) which can be found in Appendix 7. The Feeling Thermometer was scored by recording the temperature marked by each participant. For both of the explicit measures, the IOA was calculated by dividing the total number of agreements by the total number of explicit measures and multiplying by 100. IOA was calculated at 96%.

<div align="center">

Results

</div>

Overview

The data analysis for the explicit measures involved paired *t*-tests to compare means of Groups 1 and 2 pre and post-intervention. The IRAP data were analysed using statistical analyses including analysis of variance (ANOVA; 2 x 4 repeated measures with group and intervention as IVs, and IRAP trial-types (*D*-IRAP scores) as repeated measures DVs), and follow-up *t*-tests and Bonferroni post-hoc tests were used when appropriate. Pearson product-moment correlation coefficient was used to examine relationships between implicit and explicit measures.

Explicit Measures

Questionnaires and feeling thermometers. Participants were divided into two groups (*n*=30) after reading a brief description about both teaching supports (e.g., *APPLIED BEHAVIOUR ANALYSIS is effective in addressing problem*

behaviours for children. Educational and social skills are supported using ABA. The

primary means to establish new advantageous behaviour and reduce challenging

behaviour is positive reinforcement (similar to reward systems); if possible,

punishment is avoided or else used rarely"). Group 1 received an intervention with

expanded positive information (pamphlet) about Applied Behaviour Analysis and

Group 2 received expanded positive information about Positive Behaviour Support.

Pamphlets were exactly similar except for the name of the teaching support (e.g.,

Applied Behaviour Analysis or Positive Behaviour Support). The positive

information delivered in the pamphlets was relevant to both interventions and this

was held constant to determine if terminology impacted. Both groups completed pre

and post-intervention questionnaires and Feeling Thermometer tests. A paired *t*-test

was conducted to assess the impact of the positive information (intervention) on

participants' pre and post evaluations of the teaching supports for both groups (see

Table 2). For Group 1, the results from the questionnaires indicate a statistically

significant increase in positive evaluations towards ABA from pre-intervention ($M =$

7.83, $SD = 2.04$) to post-intervention ($M = 9$, $SD = 2.53$), $t (29) = -3.28$, $p = .0027$.

The results from the paired *t*-test of the Feeling Thermometer for Group 1 indicate a

statistically significant increase in positive evaluations towards ABA from pre-

intervention ($M = 75.33$, $SD = 9$) to post-intervention ($M = 83.33$, $SD = 10.93$), $t (29)$

$= -4.56$, $p < .0001$. Thus, the analysis of explicit data for Group 1 indicates that an

intervention with expanded positive information increases positive evaluations of

ABA. For Group 2, the results from the questionnaires indicate a statistically

significant increase in positive evaluations towards PBS from pre-intervention ($M =$

6.93, $SD = 2.48$) to post-intervention ($M = 8.83$, $SD = 2.40$), $t (29) = -5.43$, $p =$

$<.0001$. The results from the Feeling Thermometer for Group 2 also indicate a

statistically significant increase in positive evaluations towards PBS from pre-intervention ($M = 72$, $SD = 9.61$) to post-intervention ($M = 82.5$, $SD = 9.89$), $t (29) = -6.30$, $p < .0001$. In sum, both groups showed greater positive bias toward the relevant teaching support when expanded positive information regarding respective teaching supports was made available. There was no effect of terminology evident, in that participants' evaluations were not increased to a greater extent for Group 2 compared to Group 1 (see Table 2).

Table 2

Descriptive Statistics for Explicit Measures for Group 1 and Group 2

	Pre-Intervention		Post-Intervention			
	Group 1					
Explicit Measures	*M*	*SD*	*M*	*SD*	*F*	*P*
Questionnaire	7.83	2.04	9	2.53	-3.28	.0027
Feeling Thermometer	75.33	9	83.33	10.93	-4.56	<.0001
	Group 2					
Questionnaire	6.93	2.48	8.83	2.40	-5.43	<.0001
Feeling Thermometer	72	9.61	82.5	9.89	-6.30	<.0001

IRAP Data

Data preparation. The primary datum was response latency which can be defined as the time in milliseconds (ms) between the onset of the trial and a correct response emitted by participants. For each participant, the response latency data was transformed into *D*-IRAP scores (Barnes-Holmes, Barnes-Holmes, et al., 2010; Cullen & Barnes-Holmes, 2008). The method of transforming the response latency data is an adaptation of the *D*-algorithm developed by Greenwald, Nosek and Banaji (2003) (see IRAP paper for a detailed account of adaptation). To calculate the *D*-

IRAP scores, there were a total of 8 steps to be followed: (1) the response latency data from the test blocks were used; (2) any latencies above 10,000ms were removed; (3) data containing more than 10% of test trial blocks with latencies more than 300ms were removed; (4) 12 standard deviations for the four trial-types were calculated: four for the response latencies from test blocks 1 and 2, four from the latencies from test blocks 3 and 4, and four from the latencies from test 5 and 6; (5) 24 mean latencies were calculated for the four-trial types in each test block; (6) difference scores for each of the four trial-types were calculated for each pair of test blocks by subtracting the mean latency of the *pro-ABA bias* test block from the mean latency of the corresponding *anti-ABA bias* test block; (7) each difference score was then divided by its corresponding standard deviation from step 4, yielding 12 *D*-IRAP scores, one score for each trial-type for each pair of test blocks, (8) four overall *D*-IRAP scores were calculated by averaging the three scores for each trial-type across the three pairs of test blocks.

Given the foregoing data transformation, positive *D*-scores indicate a pro-ABA bias but negative *D*-scores indicate an anti-ABA bias (see Figure 4; data close to the x-axis indicate neutral or unbiased responding). For PBS, negative *D*-scores indicate a pro-PBS bias and positive *D*-scores indicate an anti-PBS bias. The data from 54 participants were included (i.e., Group 1 *n*=28 and Group 2 *n*=26), 6 participants' data were excluded due to failure to meet the accuracy and speed criterion (i.e., 75% correct responses within 2000ms).

Pre-intervention (Groups 1 and 2). The pre-intervention IRAP data for both groups (*n*=54) across four IRAP trial-types are presented in Figure 4. A 2 x 4 repeated measures ANOVA was conducted to determine levels of bias toward ABA/ PBS prior to intervention for Group 1 and Group 2, with group as the between-

participant variable and IRAP trial-type as the within-participant variable. There was no significant interaction between trial-types and groups, Wilks' Lambda = 6.22, F (3, 52) = 2.07, p = .11. There was a significant main effect for trial-types, Wilks' Lambda = 125.82, F (3, 156) = 41.94, p = .0001. Follow-up one-sample t-test showed that all trial-types were significantly different from zero (p= 0.05). When subjected to Bonferroni corrections only the trial-types *ABA-negative* and *PBS-Positive* were significant (p<0.05). For Group 1, the *D*-scores show an implicit bias for trial-types consistent with pro-ABA bias (i.e., faster responding to ABA-positive-true and ABA-negative-false). The *D*-scores for Group 2 show an implicit bias for pro-PBS (PBS-positive-true).

Findings were surprising as it might be expected during the pre-intervention, or "baseline" IRAP, that there would be a non-significant difference showing no preference for ABA or PBS for Group 1 and Group 2; however an implicit bias favouring ABA was shown by Group 1 and Group 2 showed a pro-PBS bias.
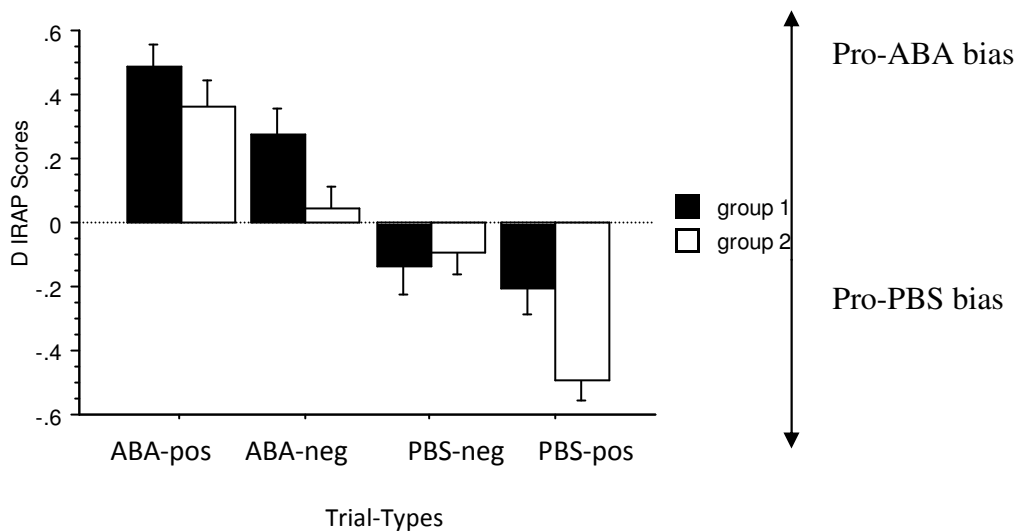

Figure 4 Pre-Intervention for IRAP data for Group 1 and Group 2 (*n*=38).

Post-intervention (Groups 1 and 2). The post-intervention IRAP data for both groups (n=54) across the four IRAP trial-types are presented in Figure 5. A 2 x 4 repeated measures ANOVA was conducted to determine levels of bias towards ABA/PBS after intervention, with group as the between-participant variable and IRAP trial-type as the within participant-variable. There was no significant interaction between trial-types and groups, Wilks' Lambda = 1.43, $F(3, 52) = .48$, $p = .70$. There was a significant main effect for trial-types, Wilks' Lambda = 154.35, $F(3, 156) = 51.45$, $p < .0001$. A follow-up one-sample t-test showed that all trial-types were significantly different from zero (p= 0.05), except for trial-type *ABA-negative* (p=0.11). Bonferroni corrections ruled out any significant differences between pre and post-intervention IRAP data for Groups 1 and 2.
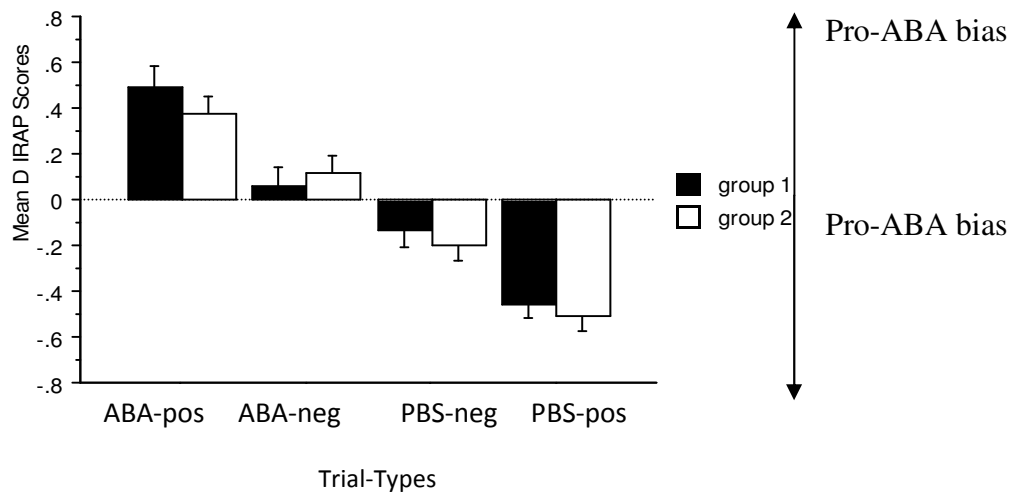

Figure 5 Post-Intervention IRAP data for Group 1 and Group 2 (n=38).

Due to the surprising positive bias shown prior to intervention for both groups respectively it was, decided to examine whether familiarity with ABA might

have exerted influence of participants evaluations. That is, despite randomised assignment to Group 1 and Group 2, participants may have been aware, or familiar, with the term "Applied Behaviour Analysis". In order to explore the data, for influence from such sources, data was removed post hoc for participants who had reported that they had heard of ABA.

Pre-intervention (Unfamiliar with ABA). The pre-intervention IRAP data for both groups (n=38) across the four trial-types are presented in Figure 6. A 2 x 4 repeated measures ANOVA was conducted to determine levels of bias towards ABA/PBS prior to intervention for Group 1 and Group 2 unfamiliar with ABA, with group as the between-participant variable and IRAP trial-type as the within-participant variable. There was no significant interaction between trial-types and groups, Wilks' Lambda = 6.02, $F(3, 37) = 2.01$, $p = .12$. There was a significant main effect for trial-types, Wilks' Lambda = 112.29, $F(3, 111) = 37.43$, $p < .0001$. One-sample t-test was conducted and showed that all trial-types were significantly different from zero ($p< 0.05$). Bonferroni corrections ruled out significant results ($p>0.05$). Both Group 1 and Group 2 show a pro-ABA (ABA/positive/true; ABA/negative/false) and pro-PBS bias (PBS/negative/false; PBS/positive/true).
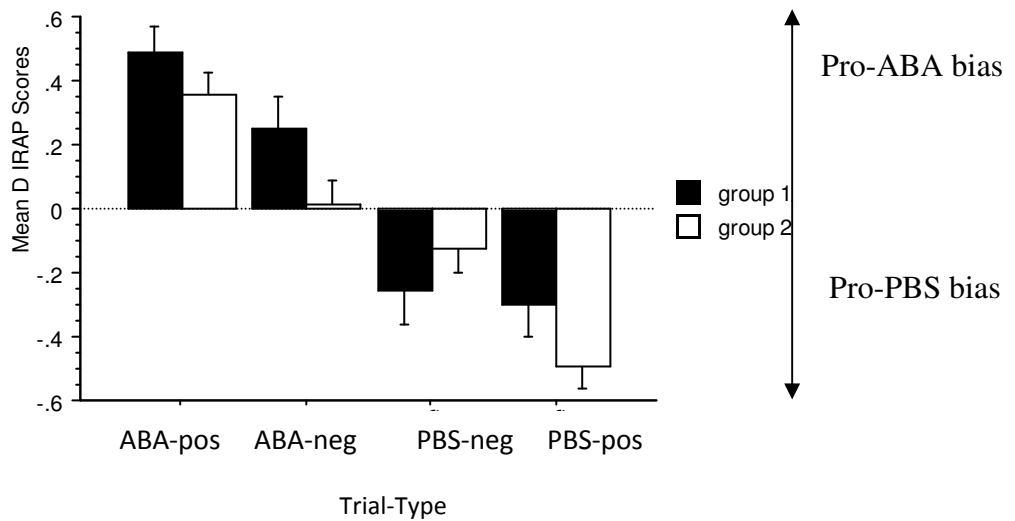
Figure 6 Pre-Intervention IRAP data for Group 1 and Group 2 with participants (*n*=38) unfamiliar of ABA

Post-intervention (Unfamiliar with ABA). The post-intervention IRAP data for both groups (*n*=38) across the four IRAP trial-types (i.e., expanded information about either ABA/PBS) are presented in Figure 7. A 2 x 4 repeated measures ANOVA was conducted to determine levels of bias toward ABA/PBS after intervention, with group as the between-participant variable and IRAP trial-type as the within-participant variable. There was no significant interaction between trial-types and groups, Wilks' Lambda = 2.68, $F (3, 37) = .90$, $p = .45$. There was a significant main effect for trial-types, Wilks' Lambda = 129, $F (3, 111) = 43$, $p < .0001$. Post-hoc t-tests with Bonferroni corrections ruled out significant results. The *D*-scores for Group 1 show an increase in preference for trial-type ABA-positive-true and a slight decrease in bias for trial-type ABA-negative-false. The data shows no change in bias for the trial-type PBS-negative-true and an increase in PBS-

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positive-true. There was no information regarding Positive Behaviour Support for this group. In general, the results for Group 2 remained the same as pre-intervention. In other words, no change in preference towards PBS after intervention was found.

As the unfamiliarity with ABA data did not shed light on the findings, it was decided to investigate whether participants' occupations may have influenced responding.
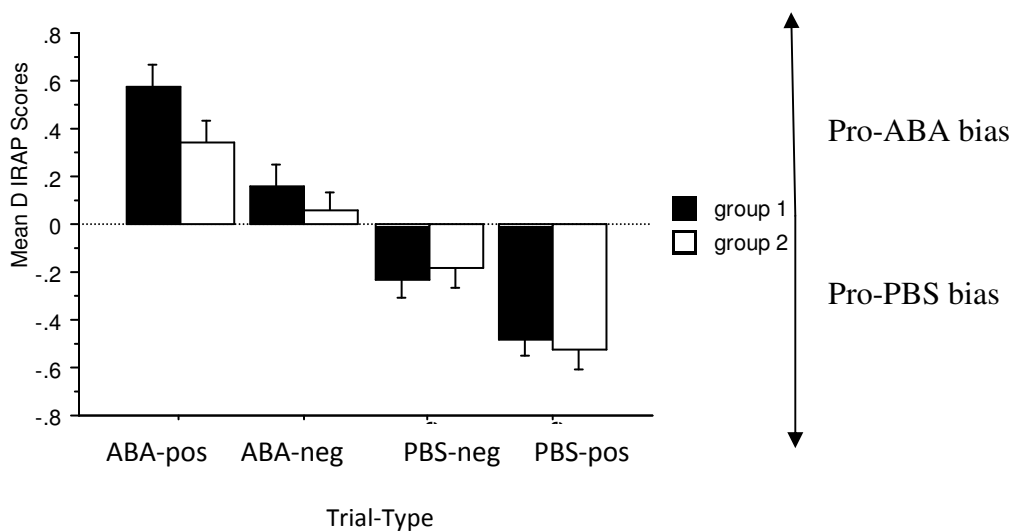

Figure 7 Post-Intervention IRAP data for Group 1 and Group 2 (*n*=38) with participants unfamiliar with ABA.

Pre-Intervention IRAP data with Participant Occupations. The pre-intervention IRAP data for participants in various occupations (*n*=54) across four IRAP trial-types are presented in Figure 8. A 2 x 4 repeated measures analysis of variance (ANOVA) was conducted to determine levels of bias toward ABA/PBS prior to intervention. There was no significant interaction between trial-types and groups, Wilks' Lambda = 5.88, $F (3, 49) = 6.54$, $p = .75$. There was a significant

main effect for trial-types, Wilks' Lambda = 58.89, F (3, 147) = 19.63, $p < .0001$.

Bonferroni corrections ruled out significant results. For psychology undergraduates, the D-scores show an implicit bias for pro-ABA bias and pro-PBS bias. All occupations show both a pro-ABA (ABA/positive/true; ABA/negative/false) and Pro-PBS (PBS/negative/false; PBS/positive/true) bias, except for psychology undergraduates as negative bias is shown for PBS/negative/true.
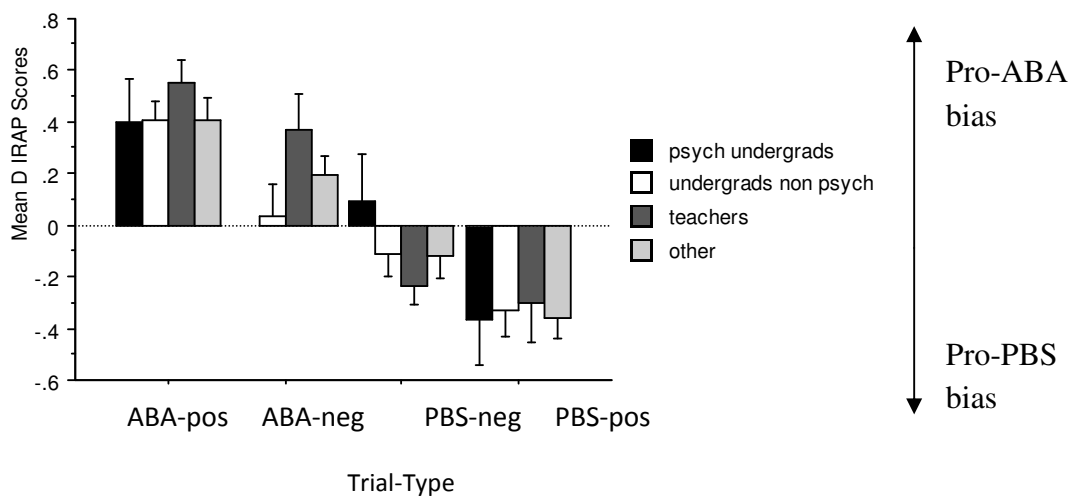

Figure 8 Pre-intervention IRAP data investigating an effect of terminology with the occupations of participants (*n*=54).

Implicit-Explicit Correlations

Pearson product-moment correlation coefficient, or Pearson correlation, was used to investigate the overall relationship between implicit evaluations and explicit evaluations (*N*=60). The results from Pearson correlation suggest that there was a non-significant relationship between implicit and explicit evaluations among participants of various occupations (see Table 3 for correlation results).

Table 3

Pearson correlation results between implicit and explicit evaluations across various occupations.

	Pre-Intervention:						Post-Intervention:					
	Questionnaires and IRAP			Feeling Thermometer and IRAP			Questionnaires and IRAP			Feeling Thermometer and IRAP		
Occupation:	*R*	*N*	*p*	*r*	*n*	*p*	*R*	*n*	*P*	*r*	*n*	*P*
Psychology Undergraduate	-.01	20	.95	-.08	20	.72	.16	20	.52	.23	20	.33
Non-Psychology Undergraduate	-.22	56	.11	-.12	56	.37	-.01	56	.93	.16	56	.24
Teacher	.07	40	.68	.01	40	.68	.04	40	.83	.01	40	.83
Other	.15	108	.12	.03	108	.73	.04	108	.70	.01	108	.93

Summary

The results from the pre-intervention IRAP for both groups did not show a significant difference for terminology as both groups showed relatively high positive biases for both teaching supports (i.e., pro-ABA and pro-PBS). These findings suggest that terminology did not have an effect on participants' implicit evaluations of the teaching supports.

The results from the pre-intervention IRAP for both groups comprised of participants who were unfamiliar with the term Applied Behaviour Analysis showed no significant difference. When participants' IRAP data were analysed for any influence of occupation, there was no significant effect shown. Pearson product-moment correlation coefficient was used to investigate the overall relationship between implicit evaluations and explicit evaluations from both groups and there were no significant correlations found between the implicit and explicit evaluations.

Chapter 3

Study 2

Examining the Effects ABA and PBS Terminology with ABA Professionals

Introduction

Findings in Study 1 showed that there is a significant difference for explicit data in both Group 1 and Group 2 pre and post-intervention. Specifically Group 1 and Group 2 showed an increase in positive bias towards the designated teaching support. There was non-significant difference in the amount of increased bias shown between the groups suggesting that terminology was not influential. There was a non-significant difference for both groups, at pre and post-intervention, shown with implicit data which is perhaps not surprising because it may be difficult to show malleability on implicit versus explicit data (Barnes-Holmes et al., 2010). Thus neither the positive information nor the terminology appeared to have an effect on implicit evaluations for both groups. Surprisingly, a positive bias for ABA was shown for Group 1 and a positive bias for PBS was shown for Group 2 prior to intervention. This was surprising as the literature as suggested that "Applied Behaviour Analysis" is a less attractive term compared to its competitor "Positive Behaviour Support" (Foxx, 1996). Post-hoc investigations were conducted however these did not illuminate the issue and any explanation of the pre-intervention findings would be speculative.

To further investigate whether the term PBS would exert a positive impact on participants' evaluations, Study 2 examined whether participants predisposed to prefer ABA would be greatly influenced by this terminology. It is likely that ABA professionals would show a favourable bias towards ABA versus PBS, and if such a pro-bias in this population was reversed or neutralised subsequent to positive information about PBS this might indicate that the term PBS had a strong impact.

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This might be shown via pre and post-intervention examination of implicit and explicit evaluations, thus the aims of Study 2 whereas follows; (1) significant findings might be relevant to ABA dissemination issues regarding simple interventions with positive information (which was found to impact explicit findings in Study 1), (2) as stated previously this would indicate an effect for terminology, and (3) may shed light on malleability of participant responding as a result of textual influence with explicit and implicit data.

Method

Participants/ Setting

Study 2 involved 40 ABA professionals, females and males aged approximately 20-37, who were currently, or previously ABA tutors or ABA students. Most were ABA tutors who were recruited via posted advertisements on the media social network site ABA-Ireland Facebook page, and from emails sent to ABA course directors or organisations such as Special Needs Schools. Data from four participants were excluded due to failure of achieving the predetermined performance criterion of 75% accuracy and 2000ms latency on the IRAP. Seven out of 40 participants self-reported to be unfamiliar with PBS (i.e. never heard of PBS). Experimental procedures were conducted in the experimental laboratory in the Department of Psychology at the National University of Ireland, Maynooth, with a closed door in order to limit any noise disruptions or distractions. A small number of participants were accommodated in completing procedures in a quiet room convenient to the participant, for example in an office.

Ethical Issues

All participation was voluntary and conducted with participants' informed consent. An information sheet and debriefing sheet was provided stating that

confidentiality of participants' identities and that of the facility to which they were affiliated would be respected at all times and in any publication related to the research. A consent form was signed prior to the beginning of the research. The information sheet, debriefing sheet and consent form were all identical to those used in Study 1. Participants were informed that data were analysed at group level and not at an individual level. In addition, participants were informed that data would be stored in an encrypted file and retained for the appropriate amount of time in accordance with legal requirements. An incentive was offered of participation in a raffle for a small prize (i.e., gift voucher), and all participants received a raffle ticket whether or not they completed all research procedures. The research was approved by the Ethics Committee at the Department of Psychology, NUI Maynooth.

Materials

Brief positive description information sheets for PBS. Similar to Study 1, an A4 sheet with 16pt Times New Roman font described PBS. For a full description of the brief positive information see the brief information materials section for Study 1.

Questionnaires for PBS. Similar to Study 1, questionnaires for PBS were a Likert-type format and a 4-point scale for rating agreement (i.e., agree strongly, agree somewhat, disagree somewhat and disagree strongly). For an outline of what the questionnaires consisted of see the materials section for Study 1. The questionnaires were identical to the PBS questionnaires used in Study 1.

Feeling Thermometers. A Feeling Thermometer which was similar to Study 1 was designed for rating participant "warmth" toward PBS treatments. For an outline of what the questionnaires consisted of see the materials section for Study 1.

The Feeling Thermometers were identical to the PBS Feeling Thermometer used in Study 1.

Expanded positive PBS information pamphlet. Similar to Study 1, the positive information pamphlet provided a summary account of PBS procedures but with much more detail than the brief positive information sheet (see Appendix 8). The information differed to the PBS expanded information pamphlet in Study 1. It described the stated the key features and benefits between both ABA and PBS from the literature. The similarities mentioned include the use of similar methods such as positive reinforcement, setting events, motivating operations, stimulus control, generalisation, functional behavioural assessment and intervention strategies. The positive information pamphlet described PBS as a "systems approach" with a three-level (i.e., three-tiered) approach to address different levels of student needs.

Implicit Relational Assessment Procedure (IRAP). As outlined in Study 1, the identical IRAP was used.

Procedure

Overview of procedures. A graphical outline of experimental procedures for Study 2 is presented in Figure 9 and participants are exposed to the same procedure as Study 1. Explicit and implicit evaluations were examined with n=38 participants (i.e., questionnaires, Feeling Thermometer, and IRAP data). Subsequently a positive information intervention, with positive features of PBS and no reference to any limitations or controversies, was delivered. Pos-intervention explicit and implicit data were examined to determine any impact resulting.

Study 2
Stage 1:
Brief Positive Information about PBS   (All participants *N*=40)
Stage 2:
PBS Rating Questionnaire and Feeling Thermometer (pre-intervention)   (All participants *N*=40)
Stage 3:
IRAP evaluation ABA/PBS (pre-intervention)   (All participants *N*=40)
Stage 4:
Intervention   **Expanded Information PBS**   (All participants *N*=40)
Stage 5:
PBS Rating Questionnaire and Feeling Thermometer (post-intervention)   (All participants *N*=40)
Stage 6:
IRAP evaluations ABA/PBS (post-intervention)   (All participants *N*=40)

Figure 9. Graphical representation of the procedure for Study 2.

Stage 1: Brief positive information regarding PBS. All participants (*N*=40) were provided with brief positive information sheets about the educational support, Positive Behaviour Support, and were asked to read the sheet.

Stage 2: Exposure to explicit measures. Similar to stage 2 in Study 1, participants were then provided with questionnaires regarding PBS. There were six questionnaire statements on each questionnaire and participants were asked to circle the rating that was most appropriate for them related to each statement. Agreement was rated on a four-point scale (i.e., Agree Strongly, Agree Somewhat, Disagree Somewhat and Disagree Strongly). There was no "neutral" or "don't know" response option for similar reasons as Study 1.

After completing the questionnaire with statements, the "Feeling Thermometer" rating procedure was presented to participants. The Feeling Thermometer consisted of a statement and an image of a thermometer with a scale of 0-100 degrees. The participant was asked to read the statement "Please indicate on the thermometer how warm you feel towards Positive Behaviour Support where 0°C is very cold and 100°C is very warm". The participant subsequently ticked along the thermometer scale to indicate how warm they felt toward the teaching support. After completing the questionnaire and Feeling Thermometer with limited information, each participant progressed to the first IRAP phase.

Stage 3: Implicit Relational Assessment Procedure (IRAP). The IRAP stage was identical to Study 1, thus for a full description of the IRAP procedure see stage 3 in Study 1.

Stage 4: Expanded positive information pamphlet about PBS. After completing the IRAP, participants were presented with an expanded positive information pamphlet regarding PBS. Having read the pamphlet, participants were then asked to complete the explicit measures again.

Stage 5: Explicit measures. Participants received the same questionnaire with statements and feeling thermometer as before. This was to investigate malleability and also whether terminology had an effect on evaluations. After completing the explicit measures, participants progressed to the final stage of the research.

Stage 6: IRAP. Participants were presented with the IRAP for a second time and followed the same procedure as outlined in Study 1. As stated previously, this was to investigate whether expanded positive information would produce change and

increase positive bias towards PBS. After completing the final stage, the participant was thanked and debriefed.

Interobserver Agreement

IOA for the explicit measures was assessed with an independent observer with a Masters in Maths. The questionnaires were assessed using the identical score sheet as used in Study 1. The Feeling Thermometer was scored by recording the temperature marked by each participant. For both of the explicit measures, the IOA was calculated by dividing the total number of agreements by the total number of explicit measures and multiplying by 100. IOA was calculated at 92.5%.

<div align="center">

Results

</div>

Overview

Similar to Study 1, the data analysis for the explicit measures involved paired t-tests to compare means of the ABA professional group pre and post-intervention. The IRAP data were analysed using statistical analyses including analysis of variance (ANOVA) 2 x 4 repeated measures with block order (i.e., consistent and inconsistent blocks) as IV and IRAP trial-types (D-IRAP scores) as DV, and follow-up *t*-tests where appropriate. As used in Study 1, Pearson product-moment correlation coefficient was used to examine relationships between implicit and explicit measures.

Explicit Measures

Questionnaires and Feeling Thermometers. Similar to Study 1, participants completed a total of four explicit measures; participant ratings of only Positive Behaviour Support were collected via a questionnaire and Feeling Thermometer pre-intervention and a questionnaire and Feeling Thermometer post-intervention (see Table 4). Unlike Study 1, the group (*n*=40) was not divided and all

participants received expanded information about the benefits of PBS. A paired *t*-test was conducted to assess the impact of the expanded information (intervention) on participants' evaluations of Positive Behaviour Support. The results from the questionnaires indicate a statistically significant increase in positive evaluations towards PBS from pre-intervention ($M = 8.08$, $SD = 2.56$) to post-intervention ($M = 8.88$, $SD = 2.45$), $t(39) = -3.01$, $p = .0046$. The results from the feeling thermometer indicate a statistically significant positive increase in evaluations towards PBS from pre-intervention ($M = 75.5$, $SD = 17.97$) to post-intervention ($M = 80.63$, $SD = 17.25$), $t(39) = -2.78$, $p = .0082$. Thus, the analysis of explicit measures indicates that an intervention with expanded information increases positive evaluations of PBS among ABA professionals.

Table 4

Descriptive Statistics of Explicit Measures for ABA professionals

	Pre-Intervention		Post-Intervention			
	ABA Professionals					
Explicit Measures	*M*	*SD*	*M*	*SD*	*F*	*P*
Questionnaire	8.08	2.56	8.88	2.45	-3.01	.0046
Feeling Thermometer	75.5	17.97	80.63	17.25	-2.78	.0082

IRAP Data

   Data preparation. As outlined in Study 1, the same data preparation was carried out (i.e. *D*-IRAP transformation of response latency), for an outline of the calculation of *D*-IRAP scores see the results section in Study 1. Given the foregoing data transformation, positive *D*-scores indicate a pro-ABA bias, but negative *D*-scores indicate an anti-ABA bias. Regarding PBS, negative *D*-scores indicate a pro-PBS bias and positive *D*-scores indicate a pro-PBS. The data from 38 participants

were included, 2 were excluded due to failure to meet the accuracy and speed criterion (i.e. 75% correct responses within 2000ms). The investigator examined the consistent and inconsistent block order in which the participants completed the IRAP.

Pre-Intervention. The pre-intervention IRAP data for block order across the four IRAP trial-types (i.e. brief description about PBS) are presented in Figure 10. A 2 x 4 repeated measures analysis of variance (ANOVA) was conducted to determine levels of bias toward ABA/PBS prior to intervention, with block order as the between-participant variable and IRAP trial-type as the within participant-variable. There was no significant interaction between trial-types and block order, Wilks' Lambda = 3.5, F (3, 36) = 1.17, p = .33. There was a significant main effect for trial-types, Wilks' Lambda = 82.96, F (3, 108) = 27.65, p < .0001. A follow-up one-sample t-test was conducted and showed that there was a significant effect for all trial-types (p< 0.05), except for *PBS-negative* (p = .69). Bonferroni post-hoc test revealed significant difference for trial-type *ABA-positive*. For consistent blocks, the *D*-scores show an implicit bias (shorter latencies indicating faster responding) for trial-types that were consistent a pro-ABA bias (ABA-positive-true/ ABA-negative-false). The results show neutrality for PBS-negative-false and a less robust bias for PBS-positive-true. For inconsistent blocks, the results show a less robust implicit bias for both a pro-ABA and pro-PBS bias.
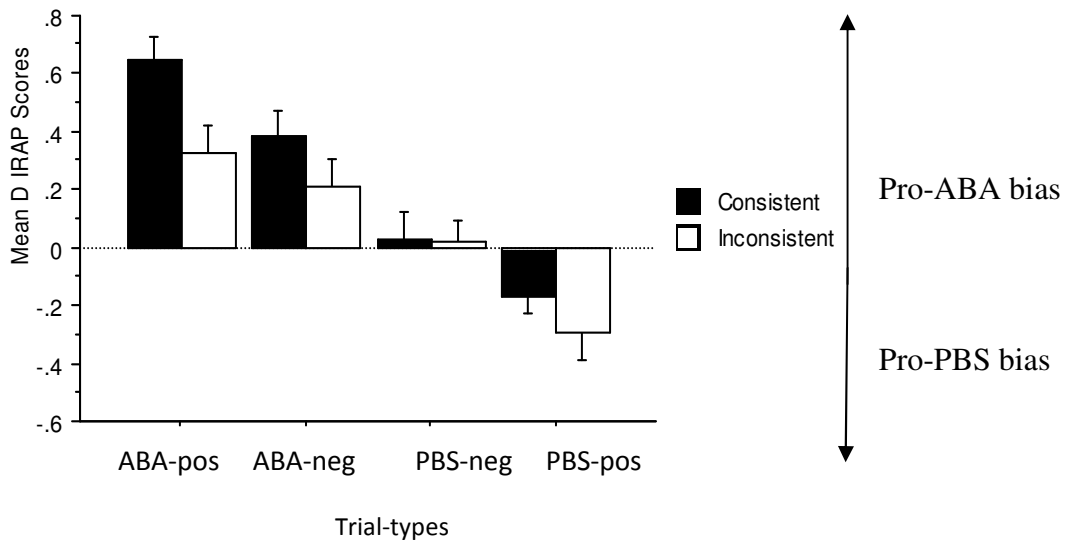
Figure 10 IRAP data for participants prior to a positive information intervention.

Post-Intervention. The post-intervention IRAP data for block order across the four IRAP trial-types (i.e., expanded positive information) are presented in Figure 11. A 2 x 4 repeated measures ANOVA was conducted to determine levels of bias toward ABA/PBS after intervention, with block order as the between-participant variable and IRAP trial-type as the within participant-variable. There was no significant interaction between trial-types and familiarity of PBS, Wilks' Lambda = 2.16, $F(3, 36) = .72$, $p = .19$. There was a significant main effect for trial-types, Wilks' Lambda = 118.53, $F(3, 108) = 39.51$, $p < .0001$. Further analysis on the trial-types, by conducting one-sample *t*-test, indicated that all trial types were statistically significant ($p<0.05$) except for *PBS-negative* ($p=0.11$). Bonferroni post-hoc tests revealed trial-type *ABA-positive* as significant ($p>0.05$). For consistent blocks, the results indicate a pro-ABA bias (ABA-positive-true/ ABA-negative-false) which are relatively the same as pre-intervention, with a slight increase in pro-PBS bias (PBS-negative-false/ PBS-positive-true) compared to pre-intervention. For inconsistent

blocks, the results indicate the pro-ABA bias remains relatively the same, compared to pre-intervention, however the results show a slight increase in a pro-PBS bias.
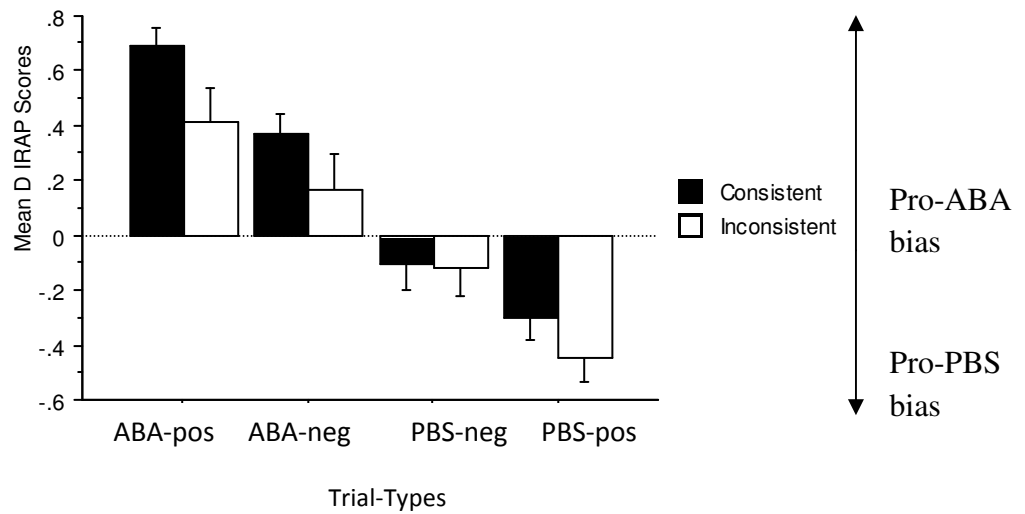

Figure 11 IRAP data for participants prior to a positive information intervention.

Implicit-Explicit Correlations

Pearson product-moment correlation coefficient was used to investigate the overall relationship between implicit evaluations and explicit evaluations. Results were non-significant and indicated no correlation between implicit and explicit measures.

Summary

Like Study 1, explicit measures (a questionnaire and Feeling Thermometer) and an implicit measure (IRAP) were utilised to examine the effect of PBS terminology on participants' (ABA professionals') evaluations. Subsequently the research also examined whether expanded information can affect either explicit and or implicit evaluations (i.e. malleability) of the teaching supports.

The results from the explicit measures showed a positive increase in PBS bias from pre-intervention to post-intervention. In other words, ABA professionals

found PBS more positive after the intervention via explicit measure. These findings suggest that the intervention of expanded positive information had an effect on participants' explicit evaluations. Implicit pre-intervention (i.e., brief description of PBS) IRAP results did not show a significant effect for PBS terminology. Post-intervention (i.e., expanded positive information) IRAP results show a pro-ABA implicit bias to remain the same as pre-intervention. Pearson product-moment correlation coefficient was used to investigate the overall relationship between implicit evaluations and explicit evaluations and indicated that there were no correlations between explicit and implicit measures.

Chapter 4

Discussion

Discussion

The current research aimed to examine whether terminology affects participant evaluations regarding the terms Applied Behaviour Analysis and Positive Behaviour Support. In addition, the research also examined malleability of participant responding in explicit and implicit measures. Over two studies these aims were examined with different populations (participants outside of the ABA field and ABA professionals). A combination of explicit measures (a questionnaire and Feeling Thermometer) and an implicit measure (IRAP) were utilised to address the current research aims. The final chapter will summarise and discuss the main findings, address the expectations of the current research, and provide suggestions for further research.

Summary of Findings

Study 1. This study examined the above stated aim with participants who were from outside the field of ABA such as psychology and non-psychology undergraduate students, teachers, and others. The results from the explicit measures for both Group 1 (ABA related questionnaires and expanded ABA positive information provided) and Group 2 (PBS related questionnaires and expanded PBS positive information provided) indicated an increase in positive evaluations from pre-intervention to post-intervention for both ABA and PBS. These findings suggested that the intervention of positive expanded information had an effect on participants' explicit evaluations for the teaching support presented to them. In addition, these findings suggested that responding on explicit measures was malleable and susceptible to the influence of the positive information intervention towards the relevant teaching support. Interestingly, the explicit measures results overall revealed that the mean score from the questionnaire was more positive for

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ABA than PBS as a teaching support. Data from the Feeling Thermometer also showed ABA to be rated as "warmer" than PBS. Explicit measures findings were significant but such findings are inconsistent with the expectations of the research and will be discussed further on.

Initially one analysis using the IRAP was conducted with both Group 1 and Group 2, however this analysis yielded non-significant results and thus the data was explored further with two more analyses. The additional analyses examined participants who were unfamiliar with ABA and examined the various occupations of participants. All analyses consisted of examining the effects of terminology by providing participants with positive information describing the relevant teaching support. Thus any positive bias shown would be deemed a positive effect of an appealing term.

The pre-intervention implicit measure results from the IRAP did not suggest a positive influence for PBS terminology. Similarly the post-intervention data did not show any impact of positive information on either group. The pre-intervention data did show an unusual baseline for both groups. Specifically Group 1 which was exposed to a positive information intervention regarding ABA showed increased positive bias compared to pre-intervention data. At baseline, it would be expected that evaluations would be similar for both groups and no bias toward either teaching support might be predicted unless terminology exerted influence (PBS more positive evaluations). The additional analyses (examining those unfamiliar with ABA and various occupations) which explored that data further did not suggest a positive influence for terminology in either the pre-intervention or the post-intervention stages. In other words there was no significant difference found in the three implicit

measure analyses. Furthermore in all three analyses participants' evaluations were not revealed as malleable.

The correlation analyses for implicit-explicit measures were conducted using the explicit measures and the three analyses utilised with the implicit measure. Overall, the correlation analyses indicated non-significant correlations between implicit and explicit evaluations which is similar to findings by Dasgupta and Greenwald (2001). It has been suggested that implicit and explicit evaluations are dissociated and may account for the difference in participants' responses (Dovidio et al., 1997; Fazio, Jackson, Dunton & Williams, 1995; Greenwald & Banaji, 1995; Wilson et al., 2000). For further theoretical and methodological explanations of the dissociation between implicit and explicit evaluations see Blair (2001), and Devine and Monteith (1999).

Study 2. Similar to Study 1, Study 2 examined whether terminology had an effect on participants' explicit and implicit evaluations and whether expanded information revealed explicit and implicit evaluations to be susceptible to malleability. Participants in this Study were ABA professionals who were past or current ABA tutors or students.

The results from the explicit measures for ABA professionals indicated a positive increase in evaluations from pre-intervention to post-intervention for PBS. These findings suggest that the intervention of positive expanded information had an effect on participants' explicit evaluations for the teaching support presented to them. In other words, the intervention revealed explicit evaluations to be susceptible to malleability as explicit evaluations increased in positivity for PBS.

The pre-intervention implicit result did not suggest a positive influence for PBS terminology. Similarly, the post-intervention IRAP results did not show

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participants' evaluations to be malleable. After the positive expanded information the findings indicated that ABA professionals still maintained a pro-ABA bias which is not that surprising due to the constant exposure to the benefits of ABA methods on a daily basis. There was a slight increase in positivity towards PBS but this was non-significant.

The correlation analyses for implicit-explicit measures were conducted using the explicit measures and the implicit measure. Overall, the correlation analyses indicated non-significant correlations between implicit and explicit evaluations which is similar to findings by Dasgupta and Greenwald (2001). In addition these findings showed support for the literature which examines the dissociation for between implicit and explicit evaluations (Blair, 2001; Devine and Monteith, 1999).

Is Terminology an Appealing Factor?

The current research examined whether terminology affects participant evaluations regarding two similar teaching supports that bear two different names; Applied Behaviour Analysis and Positive Behaviour Support. For ease of reading the terms will be referred to as ABA and PBS throughout the remaining text. Although the literature frequently highlights the negative effect of scientific terminology used in ABA compared to its counterpart PBS, the current findings were inconsistent with the assumption that PBS is more appealing (e.g. Deitz & Arrington, 1983; Bailey, 1991; Lindsley, 1991; Lamal, 1995). The scientific terminology may not be readily understood by a lay audience but the findings in the current research showed no effect of implicit evaluations.

Surprisingly PBS terminology did not have an effect on evaluations among the sample of the wider community as previously hypothesised. The literature has continuously highlighted the reoccurring terms "person-centred" and "quality of life"

within the PBS field (APBS, 2007; Anderson & Freeman, 2000; Horner, 2000). The words used in the teaching support; "Positive" and "Support", would instantly suggests positive connotations compared to "Applied Behaviour Analysis" which instantly suggests scientific connotations (Johnston et al., 2006). Contradictory to this, the current research showed a lay audience rated ABA as "warmer" than PBS on explicit measures which is inconsistent with a pilot study and its preliminary findings (Best et al., unpublished thesis). Best et al. found, overall, that there were more positive evaluations towards a PBS approach in effective mainstream school interventions compared to an ABA approach. Furthermore, Best et al. found that post-intervention (an educational DVD on ABA) there was an increase in pro-ABA bias shown via the IRAP but in the current study this was not replicated for either Group 1 or Group 2. A possible explanation for the lack of replication is that the current study used a textual intervention rather than a visual intervention which may have acted as a more effective intervention.

Difference in Explicit and Implicit Data

The current research examined malleability of both explicit and implicit evaluations of ABA and PBS. As mentioned in Chapter 1, explicit measures generally predict intentional and controlled behaviours (Dovidio et al., 1997; Dovidio et al., 2009) whereas implicit measures tend to reveal spontaneous judgement (Freise et al., 2008; Galdiet al., 2008; McConnell & Leibold, 2001). The explicit evaluations found in Study 1 and Study 2 proved to be malleable which was similar to Gregg et al's (2006) findings. The implicit measures results from Study 1 suggested implicit evaluations were not malleable again supporting Gregg et al's findings. The intervention used in Gregg et al's study was a written passage about two novel fictitious groups which is very similar to the current research. If explicit

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measures do not reveal spontaneity and automatic responses to stimuli this could be an explanation as to why explicit evaluations were malleable and not for implicit evaluations.

Some participants from Study 1 stated that they were unfamiliar with the terms ABA and PBS and as a result were encountering the terms for the first time. Thus the terms were novel stimuli to these participants, similar to the fictitious groups in Gregg et al's (2006) study, and were essentially being asked to form novel evaluations. Unlike Olson and Fazio (2001) classical conditioning was not used as the research investigated whether expanded information can reveal malleability of implicit evaluations. There are, however, studies demonstrating malleability of prejudice implicit evaluations such as Cullen et al. (2009) and Dasgupta and Greenwald (2001). The intervention used within these studies consisted of images, similar to Best et al's (unpublished thesis) study, and may be why implicit evaluations did not reveal malleability in the current research.

Dissemination, Terminology and Social Acceptance

Explicit measure findings from Study 1 showed that a simple positive information intervention produced change in explicit ratings of the relevant teaching support. This finding suggests that dissemination of ABA can be as simple as a positive information pamphlet outlining the benefits of ABA. Despite approximately 50 years of ABA research, the current study suggested participants from the wider community remain unfamiliar with ABA which may impede on the social acceptance of ABA. The lack of familiarity of the terms ABA and PBS among a lay audience and the lack of familiarity of PBS amongst some ABA professionals suggests that more dissemination is needed within the Irish context. Effective dissemination, or marketing, has been reported as a struggle by many behaviour

analysts (e.g. Axelrod, 1996; Bailey, 1991; Foxx, 1996; Morris, 1985; Neuringer, 1991; Turkat & Feuerstein, 1978). There is a body of research demonstrating how effective behaviour analysis is as an approach to behavioural issues but it appears that the field has not applied this to marketing the science (Austin & Marshall, 2008). Unfortunately, ABA can be overlooked by a lay audience as a result of the lack of marketing.

Dissemination of research tends to occur via journal articles and conferences where scientific terminology is evident. Other means of marketing are needed, especially if it is the wider community who are the consumers and accepters of the behavioural interventions. Dissemination should consider using a universal language, or lay terminology, as opposed to scientific terminology which may factor as an implication for the widespread use of ABA (Bailey; 1991; Lindsley, 1991; Wolf, 1978). Lay terminology can be used when conversing with those outside of the field while not compromising any behavioural concepts, principles or methods (Foxx, 1996). Bailey and Burch (2009) addressed the need for marketing via lay terminology in a user-friendly approach. Austin and Marshall pointed out that some behaviour analysts may not approve of the language used within the approach but without the acceptance of the wider community the science may not evolve (Wolf, 1978). With a variety of treatment options (e.g. medication, speech therapy and counselling) widely available, ABA needs to be recognised and be acknowledged as an effective treatment.

In recent years, there has been some publicity by the media highlighting ABA as a treatment, or intervention, to some behavioural issues associated with autism (Austin & Marshall, 2008). Specifically, early intervention has received attention by the wider community and seen as a treatment of choice for young

children with autism (Green, 1996; Thomson, Martin, Arnal, Fazzio & Yu, 2009).

Despite this positive marketing, behaviour analysis extends further than intervening

with behavioural issues associated with autism. Austin and Marshall pointed out that

this fact is often seen as surprising to those unfamiliar with behaviour analysis, again

highlighting the need of dissemination and use of lay terminology. Thus

dissemination of what behaviour analysis has to offer may increase familiarity and

acceptance of the support among those outside of the field of ABA.

Future Research

Although the findings were non-significant, the current research adds to the

literature in the area of behaviour analysis terminology and its effects on implicit and

explicit evaluations. In addition, the current research adds to the literature of

malleability and how susceptible implicit and explicit evaluations are to malleability.

The findings highlighted the need for dissemination among those outside of the field

of ABA (i.e., the consumers).

The research is a preliminary study and an extension to Best et al's

(unpublished thesis) preliminary study, in that it examined the result of the explicit

measures question (PBS seen as more effective than ABA as an intervention in a

mainstream classroom). The results were inconsistent to Best et al's findings;

however, future research in this area may present a video intervention rather than a

textual intervention. With a similar procedure, the video intervention may

demonstrate significant findings for terminology for either ABA or PBS. To examine

the extent of malleability, the groups could be sub-divided further and present two

types of interventions (text and video) to participants. The results may show the

extent to which implicit and explicit evaluations are malleable.

Finally, future research in this area may consider using a participant sample of teachers and the effect terminology can have on implicit evaluations. McCormick (2011) found from a survey that special education teachers had a more accurate knowledge of behaviour analysis than general education teachers. Due to more familiarity with behaviour analysis there may be an effect for terminology among special education teachers and general education teachers. It would be interesting to investigate this area as Bailey (1991) highlighted that teachers would benefit from applying behaviour analysis to behaviour problems emitted by students.

Conclusion

Findings demonstrated that a simple positive information intervention increased positive bias in explicit evaluations and may be relevant to dissemination among those outside of the field of ABA. Overall there were no significant results for effects of terminology on implicit evaluations shown in Study 1 and Study 2. However, malleability of participants' explicit evaluations for both Study 1 and Study 2 was revealed. The results are inconsistent with findings from a previous study but nonetheless the findings add to the literature. Further investigation is needed to examine whether written versus DVD format as an intervention is more effective to convey positive information to lay audiences. As this is a preliminary study, more research is needed in the area of the effects of behavioural terminology and its acceptance among lay audiences. Despite non-significant findings, the current research adds to the literature and highlights the need for dissemination.

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Appendices

Appendix 1: Information sheet, debriefing sheet, consent form and additional information sheet

Appendix 2: Brief ABA and PBS information

Appendix 3: Questionnaires ABA/PBS

Appendix 4: Feeling thermometer ABA/PBS

Appendix 5: Expanded ABA information

Appendix 6: Expanded PBS information

Appendix 7: Questionnaire score sheet

Appendix 8: Expanded PBS information for ABA professionals

Appendix 1: Information sheet

Information Sheet

 INFORMATION ABOUT RESEARCHER AND SUPERVISOR

I, Kelly Larkin, am a currently registered student in the Doctorate in Psychological Science (Behaviour Analysis and Therapy) at the Department of Psychology, National University of Ireland, Maynooth, Co. Kildare. I have obtained a B.A. degree in Psychology, also at NUIM. The research is supervised by Dr. Carol Murphy BCBA-D, lecturer at the Department of Psychology, National University of Ireland, Maynooth, Co. Kildare. To contact the researcher regarding any questions re:the research, please feel free to do so via email to kannelarkin@gmail.com .

DESCRIPTION OF RESEARCH

The research is looking at attitudes toward teaching supports such as applied behaviour analysis (ABA) and positive behaviour support (PBS), that are often used to address students' behavioural problems. You do not have to have knowledge about these supports.

WHAT WILL MY PARTICIPATION INVOLVE?

Firstly, you will be provided with brief information about ABA and PBS and you will be asked to complete pen and paper questionnaires with statements such as "ABA is very useful in reducing challenging behaviour"/ "PBS is very useful in reducing challenging behaviour". You can tick a box to agree or disagree somewhat, strongly or not at all, and this is so we can rate your impressions. You will be asked to rate ABA and PBS on a scale of 1-100 for "warmth". You will then be given step-by-step instructions by the researcher on how to complete a computer programme which will ask you to sometimes agree and sometimes disagree with positive and negative words presented alongside the terms ABA and PBS (e.g., ABA/Brilliant; PBS/Brilliant; ABA/Rubbish; PBS/Rubbish). This will take approximately up to 45 minutes to complete.

Secondly there is a powerpoint presentation (approximately 20 mins.) with the researcher providing information about one of the teaching supports to you and other participants in a group setting. After this, you will be asked to repeat the first stage, which may take approximately up to

45 minutes. You may be able to complete your participation in two 1hr sessions (approximately), or if you choose, in three sessions, one of which should take only 20 mins (i.e., presentation session).

Participation will be confidential as data collected will be coded and analysed at a group level. The data will be stored securely in an encryption file on the researcher's laptop and will be destroyed in 5 years time. The coded data may be reviewed by fellow researchers after reading the finished report or if the research is to be expanded.

All participants will be entered into a raffle for a token gift in appreciation of their time, once they commence participation, whether or not they fully complete participation.

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 Head of Departmental Ethics Committee Dr Bryan T Roche at: Bryan.T.Roche@nuim.ie*. Please be assured that your concerns will be dealt with in a sensitive manner.*

Debriefing Form

Thank you for taking part in this research. If you have any further queries about the research please feel free to ask the researcher. Please see the 'Frequently Asked Questions" segment below which should answer any questions you may have.

If you still have further queries about the research please do not hesitate to contact Dr. Carol Murphy who is supervising the research via email Carol.A.Murphy@nuim.ie .

<div align="center">Frequently Asked Questions</div>

1. **What is an implicit attitude?**
Answer: An attitude is a positive or negative evaluation of an object. Implicit attitudes as defined by Greenwald and Banaji (1995) are "introspectively unidentified or inaccurately identified traces of past experiences that mediate favourable or unfavourable feeling, thought, or action toward social subjects" (p.8). The core argument is that implicit attitudes are often unconscious and thus influence on behaviour may go unnoticed. Due to implicit attitudes being unconscious, explicit, or self report, measures such as questionnaires will more likely fail to measure true implicit attitudes.

2. **How does the IRAP measure implicit attitudes?**
Answer: The IRAP requires you to respond very quickly to relational tasks that reflect your current perceptions, or beliefs (i.e. consistent trials) than to tasks that do not (i.e. inconsistent trials). So, if you found it easier to categorise ABA positively and PBS negatively relative to trials that involved the opposite categorisations, this suggests a bias towards ABA.

3. **What does it mean if I get a test result that I don't believe describes what I think?**
Answer: The IRAP is not 100% accurate. As is often the case, if you repeated the test you may find that your outcome will change slightly. If you repeat the same test and the outcome does not change, the result is definitely more trustworthy than the first result alone. To observe a large difference in one sitting to the next would be quite unusual.

4. **The red Xs forced me to give a response that I did not agree with. Does that mean the test is no good for me?**

Answer: No, it would generally be observed that you would find responding to some of the tasks more difficult than the other. This is what the test has been designed to do.

5. If I consistently score 75% or less, does this mean I have no implicit preference?

Answer: The test has certain criteria that must be reached in order for the results to be interpretable. If you scored 75% or less consistently throughout the test, it means that there are too many errors to interpret the results. It means that the data cannot be interpreted with confidence with regard to implicit preferences. This does not mean that you did not have an implicit preference.

6. What can I do about an implicit preference that I would rather not have?

Answer: It is important to remember that the IRAP is not 100% accurate. You may wish to repeat the test again to see whether your outcome changes before drawing a conclusion. If there is no change to the result, it is fair to say that this result is trustworthy. However, it is possible to possess an undesirable implicit preference. A suggested solution would be to seek experiences that may alter your implicit preference by altering your patterns of experience. An example of an experience can consist of reading material which opposes your preference. Perhaps a more practical alternative would be to be more aware if your implicit preference so it does not cloud your judgement or actions in which it may become involved.

7. What are explicit attitudes?

Answer: Explicit attitudes and beliefs are directly expressed or publicly stated. For example, the question as to what you think of a particular educational method prior to completing the IRAP is how your explicit attitudes would be measured in this case. The standard procedure for measuring such explicit attitudes is known as 'self-report' which involves directly asking people to give or describe their attitudes by using an open-ended interview or questionnaires.

8. What does it mean if the explicit and implicit measures don't agree with each other?

Answer: The simplest explanation is that the individual may be unwilling to give their honest preference in a questionnaire as it may not agree with the 'social norm'. However, it is fair to suggest that an individual may be unable to accurately report their attitudes.

9. Could the result of my implicit preference be due to the order in which I responded? As I found it easy to respond to the first order, but difficult for the second order?

Answer: The order does in fact make a *small* difference in some tests to the overall result. This is known as the 'order effect'. In orders to alleviate this problem, the order used to present the order of the words in the IRAP are random. It has been monitored that half of the participants got the *A then B order* and the other half got the *B then A order.*

Consent Form.

I, Kelly Larkin, am a currently registered student in the Doctorate in Psychological Science (Behaviour Analysis and Therapy) at the Department of Psychology, National University of Ireland, Maynooth, Co. Kildare. I have obtained a B.A. degree in Psychology, also at NUIM. The research is supervised by Dr. Carol Murphy BCBA-D, lecturer at the Department of Psychology, National University of Ireland, Maynooth, Co. Kildare. To contact the researcher regarding any questions re:the research, please feel free to do so via email to kannelarkin@gmail.com .

In signing this consent form I am aware of the following:

- I understand that my,data will be coded and my name will be removed, and that neither I or my place of work will be identified in any presentation or publication.
- I understand that no record carrying my personal identity will be retained
- I understand that resulting findings will be analysed and reported or published at a group level, not at an individual level.
- I understand that I will be provided with an explanation of the research after participation.
- I understand that my participation is voluntary, and that I can terminate my participation at any time during the research until the point of data being coded.
- I have been provided with an Information Sheet outlining the procedures involved in participation.
- I understand that the group data will be numerically coded and stored on the researcher's laptop for five years as it may be requested by another researcher for research expansion purposes, and after this time all the data will be destroyed.

By signing this I am stating that I have read and understand the information provided here and on the Information Sheet, and consent to participate in this study.

Signature:_____ **Date:** _____

Additional Information Sheet

Participant Number: _____

Please tick a box to indicate if you are a:
1. Psychologist in clinical or applied facility
2. Teacher at a mainstream school
3. Special Needs Assistant
4. Parent or relative of an individual attending a clinical or applied setting
5. Teacher at a special needs school
6. Undergraduate (psychology)
7. Undergraduate (non-psychology)
8. Other (please specify)_____

Has your facility any direct experience of ABA services?   Yes
    No

Have you or your family direct experiences of ABA services?   Yes
    No

Have you ever heard of ABA?   Yes
    No

What age are you? _____

Have you ever heard of PBS?   Yes
    No

Have you any direct experiences of PBS?   None/ some/ lots

APPLIED BEHAVIOUR ANALYSIS

ABA

APPLIED BEHAVIOUR ANALYSIS is effective in addressing problem behaviours for children. Educational and social skills are supported using ABA. The primary means to establish new advantageous behaviour and reduce challenging behaviour is positive reinforcement (similar to reward systems); if possible, punishment is avoided or else used rarely.

POSITIVE BEHAVIOUR SUPPORT

PBS

Problem behaviour at school is effectively addressed using POSITIVE BEHAVIOUR SUPPORT. PBS can be used also to support educational and social skills. Positive reinforcement (similar to reward systems) is the primary means to establish new advantageous behaviour and reduce challenging behaviour; punishment is largely avoided but may apply in exceptional cases.

Appendix 3 Questionnaires ABA/PBS
CONFIDENTIAL QUESTIONNAIRE: PERCEPTIONS OF TEACHING SUPPORTS

Please indicate your agreement/disagreement with each statement by circling a letter

A=Strongly Agree, B=Agree Somewhat, C=Disagree Somewhat, D=Strongly Disagree

Statement	Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly
1. Applied Behaviour Analysis treatments are primarily based on positive reinforcement	A	B	C	D
2. Applied Behaviour Analysis treatment can reduce or eliminate aggressive behaviours	A	B	C	D
3. Children with a range of problem behaviours can benefit from Applied Behaviour Analysis treatments	A	B	C	D
4. Applied Behaviour Analysis increases learning in children with autism	A	B	C	D
5. The quality of school life for a child can be enhanced by using Applied Behaviour Analysis treatment methods	A	B	C	D
6. Applied Behaviour Analysis is better than Positive Behaviour Support for behaviour problems with typically-developing children	A	B	C	D

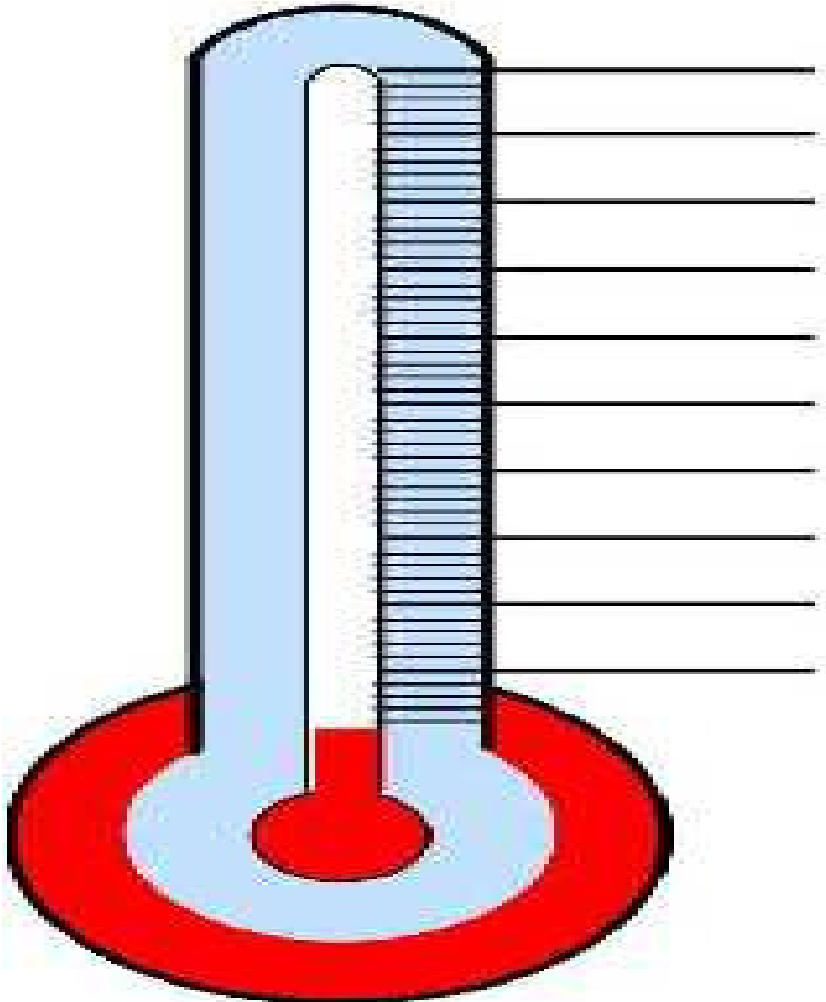**CONFIDENTIAL QUESTIONNAIRE: PERCEPTIONS OF TEACHING SUPPORTS**

Please indicate your agreement/disagreement with each statement by circling a letter

A=Strongly Agree, B=Agree Somewhat, C=Disagree Somewhat, D=Strongly Disagree
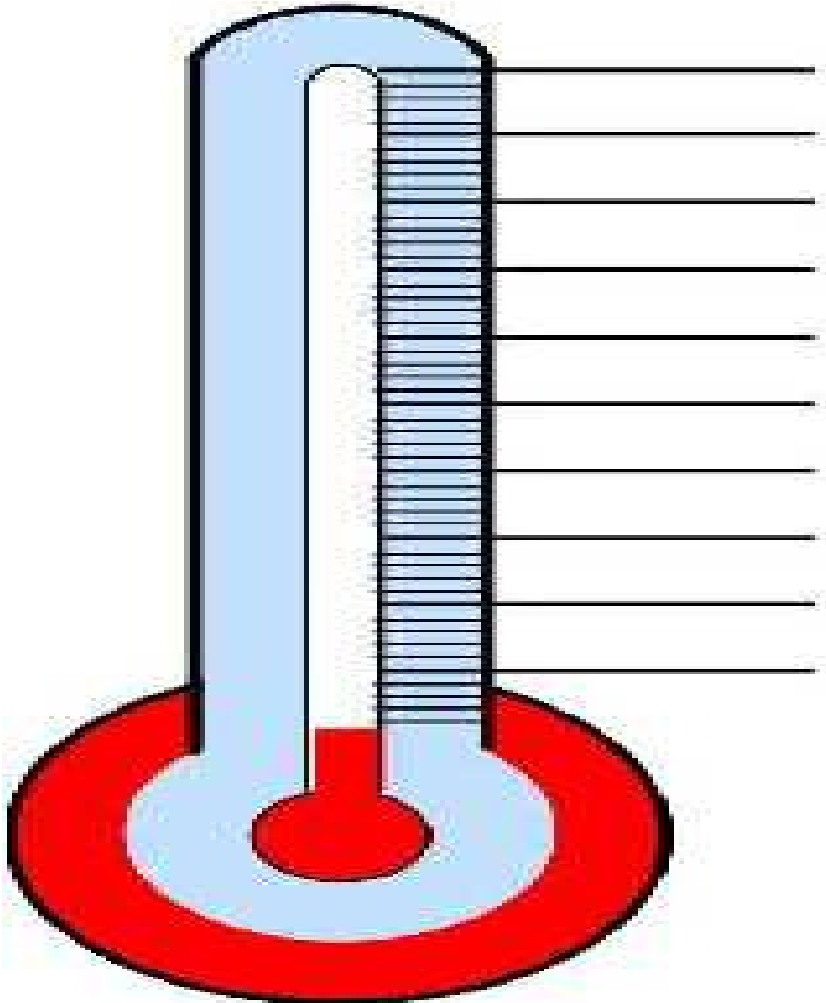
Statement	Agree Strongly	Agree Somewhat	Disagree Somewhat	Disagree Strongly
1. Positive Behaviour Support treatments are primarily based on positive reinforcement	A	B	C	D
2. Positive Behaviour Support treatment can reduce or eliminate aggressive behaviours	A	B	C	D
3. Children with a range of problem behaviours can benefit from Positive Behaviour Support treatments	A	B	C	D
4. Positive Behaviour Support increases learning in children with autism	A	B	C	D
5. The quality of school life for a child can be enhanced by using Positive Behaviour Support treatment methods	A	B	C	D
6. Positive Behaviour Support is better than Applied Behaviour Analysis for behaviour problems with typically-developing children	A	B	C	D

Appendix 4 Feeling Thermometer

Please indicate on the thermometer below how you feel towards Applied Behaviour Analysis where 0°C is very cold and 1000°C is very warm.

Please indicate on the thermometer below how you feel towards Positive Behaviour Support where 0°C is very cold and 1000°C is very warm.

Applied Behaviour Analysis (ABA)

- Applied behaviour analysis can be used for positive change - to increase adaptive behaviour and decrease problem behaviour

- For example, if at school a 6-yr-old boy frequently hits other children, ABA uses positive reinforcement and other specialised tactics to teach appropriate peer interactions and replace inappropriate hitting

ABA IS SCIENCE-BASED WITH STRONG SUPPORTING EVIDENCE

Tried and tested ABA procedures include:

- *Functional Behavioural Assessment.* It is crucial to discover the purpose of problem behaviour in order to direct _effective_ intervention.
- *Positive Reinforcement.* A very powerful means of teaching new adaptive behaviours.

ABA avoids the use of punishment or intrusive procedures as much as possible. Punishment procedures may be used, however, in certain circumstances (e.g., if positive reinforcement has failed; if dangerous behaviour requires it for a brief period).

Applied Behaviour Analysis and Reinforcement

IT'S ALL ABOUT CONSEQUENCES......

A simplified explanation of PB and reinforcement:

Problem behaviour usually functions for an individual in order to *get something or to get out of something........*

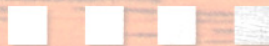Positive reinforcement means the behaviour results in a gain for the individual

- Example:

- Billy and Bob are talking and laughing out loud during class

- Consequence: Teacher approaches saying "Stop talking" or "Quiet, please", other children look on. The *consequence* of social attention may reinforce the talking during class.

Negative reinforcement means the individual gets out of something aversive

- Example:

- When Amy is disruptive in class Teacher sends her out of the classroom.

- The *consequence* is a brief escape from classroom work.

REINFORCEMENT may require CAREFUL application!

Behaviour that is reinforced increases, so it's important to get it right.

Functional Behavioural Assessment:

Student problem behaviours may include refusals to complete tasks, angry or tantrum behavior, communication problems, or various irritating or disruptive behaviours. Before an intervention is put in place, it is important to understand *why* the problem behaviour is occurring. Research has shown that interventions that are based on an understanding of the purpose of the PB are more successful. Thus, a functional behavioural assessment is an important procedure in ABA to discover why the problem behaviour occurs for an individual – understanding what reinforcement the behaviour produces for that particular individual helps in planning an effective intervention.

For example, if the PB functions to gain social attention for the individual, an intervention will need to plan for the individual to gain social attention via another means, as well as ensuring that social attention is no longer available for PB (if the behaviour is dangerous it cannot be ignored, but social attention will be kept to a minimum). If PB functions to escape a disliked situation, an intervention will plan for the individual to be taught an appropriate way to end disliked situations; in addition the PB will no longer result in escape from demanding situations. This type of function-based intervention has been proven to be very effective in addressing a wide range of challenging behaviours.

It might be said that a FBA examines the *who/what/where/when* of a problem occurrence in order to understand the *why*. This can be done by a variety of methods including structured interviews with individuals, parents, teachers, direct observation *in situ* and recording of the problem behavior, and in some cases arranging for a functional analysis which is a more precise experimental procedure to determine if attention, task demand, or internal stimulation is producing the problem behaviour. These procedures are considered so important to effective intervention that a FBA is mandated by legislation (e.g., across the U.S.) prior to any serious intervention being conducted at school with a child with developmental difficulties.

APPLIED BEHAVIOUR ANALYSIS

Summary

Positive reinforcement may be applied at various levels depending on student requirements. For some students reinforcement applied in the general school environment may be sufficient to keep them "on track" – for example, many students may work hard to gain high grades and to avoid poor grades or sanctions, however better outcomes may result with greater emphasis on positive reinforcement for desirable social and academic behaviour, rather than if avoidance of failure/punishment is the more prevalent reinforcer. Many students may require more 'finely attuned' attention in small groups and positive reinforcement may be arranged on a group level. Still other students may require individualized attention with positive reinforcement tailored to their specific needs, until such time that they make sufficient progress to enter a group teaching system. Thus, ABA may be used as a preventative as well as a 'treatment' approach to problem behaviour.

Positive Behaviour Support (PBS)

- Positive Behaviour Support can be used for positive change - to increase adaptive behaviour and decrease problem behaviour

- For example, if at school a 6-yr-old boy frequently hits other children, PBS uses positive reinforcement and other specialised tactics to teach appropriate peer interactions and replace inappropriate hitting

PBS IS SCIENCE-BASED WITH STRONG SUPPORTING EVIDENCE

Tried and tested PBS procedures include:

- *Functional Behavioural Assessment.* It is crucial to discover the purpose of problem behaviour in order to direct *effective* intervention.
- *Positive Reinforcement.* A very powerful means of teaching new adaptive behaviours.

PBS avoids the use of punishment or intrusive procedures as much as possible. Punishment procedures may be used, however, in certain circumstances (e.g., if positive reinforcement has failed; if dangerous behaviour requires it for a brief period).

Positive Behaviour Support and Reinforcement

IT'S ALL ABOUT CONSEQUENCES......

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Positive reinforcement means the behaviour results in a gain for the individual

- Example:

- Billy and Bob are talking and laughing out loud during class

- Consequence: Teacher approaches saying "Stop talking" or "Quiet, please", other children look on. The **consequence** of social attention may reinforce the talking during class.

Negative reinforcement means the individual gets out of something aversive

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- The **consequence** is a brief escape from classroom work.

REINFORCEMENT may require CAREFUL application!

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POSITIVE BEHAVIOUR SUPPORT

Summary

Positive reinforcement may be applied at various levels depending on student requirements. For some students reinforcement applied in the general school environment may be sufficient to keep them "on track" – for example, many students may work hard to gain high grades and to avoid poor grades or sanctions, however better outcomes may result with greater emphasis on positive reinforcement for desirable social and academic behaviour, rather than if avoidance of failure/punishment is the more prevalent reinforcer. Many students may require more 'finely attuned' attention in small groups and positive reinforcement may be arranged on a group level. Still other students may require individualized attention with positive reinforcement tailored to their specific needs, until such time that they make sufficient progress to enter a group teaching system. Thus, PBS may be used as a preventative as well as a 'treatment' approach to problem behaviour.

Appendix 7 Scoresheet for both questionnaires

Question	A	B	C	D
1	+2	+1	-1	-2
2	+2	+1	-1	-2
3	+2	+1	-1	-2
4	+2	+1	-1	-2
5	+2	+1	-1	-2
6	+2	+1	-1	-2

Adapted from Best et al. (unpublished thesis).

POSITIVE BEHAVIOUR SUPPORT

PBS

Positive Behaviour Support (PBS)

Positive Behaviour Support is derived from research in applied behavior analysis (ABA) and uses similar methods such as positive reinforcement, setting event, motivating operations, stimulus control, generalization, and similar functional behavioural assessment and intervention strategies. Interventions in PBS are based on principles of a science of behaviour, and an emphasis is placed on evidence-based methods.

PBS came about in response to negative perceptions related to the early history of ABA and associations with aversive intervention procedures that demeaned the individuals receiving treatment. Indeed a major tenet of PBS expressed at the foundation was avoidance of the use of aversive techniques or punishment procedures in addressing problems for vulnerable populations such as individuals with intellectual disability. Currently, both PBS and ABA express strong preference for positive reinforcement procedures although both regimes may use punishment procedures in exceptional cases, for example where reinforcement procedures have failed to bring about behaviour change, or as a short-term interim intervention to prevent dangerous or injurious behaviour. In PBS, however, the rejection of the use of aversive control and or punishment procedures has been more emphatically and explicitly advocated, or at least more frequently articulated.

PBS

The PBS model espouses "person-centered planning" and uses terms such as "improved quality of life", whereas traditional ABA avoided such global terms that were considered vague, in favour of specific measurable targets/goals. The more holistic terminology in PBS, combined with a clearly articulated strong emphasis on prevention strategies, has perhaps enhanced its appeal and contributed to more widespread acceptance with a range of service providers. The multi-tiered approach used in PBS (e.g., different levels of intervention intensity adjusted to suit the severity or otherwise of the problem) has likely also facilitated the advent of whole-school PBS applications, whereas ABA may be more associated with single-subject-design and interventions for individuals with high-risk behaviour rather than applications for larger groups or communities.

A systems approach for establishing effective learning environments for all students.

Three-tiered system of intervention

1. *A preventative intervention strategy is used for the majority (approximately 80%) of students:*

- *Define and teach positive social expectations*

- *Acknowledge positive behaviour*

- *Arrange consistent consequences for problem behaviour*

- *On-going collection and use of data for decision-making*

- *Administrative leadership – Team-based implementation*

- *Applied to all classrooms and whole of school and staff*

2. A continuum of intensive, small group and or some individualised interventions (approximately 20%) of students.

3. Specialised individualised intensive intervention for students with serious behaviour problems (5%).

Interestingly, in a relatively short time period, the PBS movement has been far more successful than ABA in gaining more large-scale and widespread use in application, and appears to be more appealing to educational and even political communities, in that there has been much greater willingness to fund PBS interventions (in the U.S.). The reasons for this are not entirely clear and a number of factors may be involved.

The connection between PBS and ABA may be beneficial for both, however, in that the former may continue to promote to widespread use of behavioural technologies and large-scale interventions, and the latter will likely continue to produce replicable science-based intervention techniques that can support the continued development of PBS.