An Empirical Investigation of Self: Bridging the Gap between ACT, Mindfulness and RFT

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Publications

Sections of this thesis are currently in press, published or under review. The chapter number, chapter name and the corresponding citations are listed below.

Chapter 1 (General Introduction)

Foody, M., Barnes-Holmes, Y., & Barnes-Holmes, D. (2012). The role of self in Acceptance and Commitment Therapy (ACT). In L. McHugh & I. Stewart (Eds.), *The self and perspective taking: Research and applications* (pp. 125-142). Oakland, CA: New Harbinger.

Foody, M., Barnes-Holmes, Y., & Barnes-Holmes, D. (2013). On making people more positive and rational: the potential downsides of positive psychology interventions. In T. Kashdan & J. Ciarrochi (Eds.), *Bridging Acceptance and Commitment Therapy and Positive Psychology: A Practitioner's Guide to a Unifying Framework*. Oakland, CA: New Harbinger.

Barnes-Holmes, Y., Foody, M., Barnes-Holmes, D., & McHugh, L. (2013). Advances in research on deictic relations and perspective-taking. In S. Dymond & B. Roche (Eds.) *Advances in Relational Frame Theory: Research & Application*. Oakland, CA: New Harbinger.

Dunne, S., Foody, M**.,** Barnes-Holmes, Y., Barnes-Holmes, D., & Murphy, C. (in press). Facilitating Repertoires of Coordination, Opposition, Distinction, and Comparison in Young Children with Autism. *Behavioral Development Bulletin.*

Chapter 2 (Experimental Comparison of Two Distress Induction Procedures)

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Chapter 5 (Investigating Hierarchical vs. Distinction Relations in Self-based ACT Techniques)

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Chapter 6 (General Discussion)

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Abstract

Abstract

The current programme of research had four main aims. First, we hoped to extend existing work on experimentally induced distress with non-clinical samples of adult participants (male and female college students aged approximately 18-50 years), with a particular focus on finding an appropriate preparation that would lend itself to the exploration of brief therapeutic interventions. Second, we investigated the impact of techniques referred to as *self as context* in terms of ameliorating distress induced by the single-sentence preparation. Third, we compared effects of mindfulness and *self as context* techniques on distress reduction, and subsequently investigated effects of individual components of mindfulness. Finally, we explored the potential role of concepts derived from relational frame theory (RFT) in enhancing *self as context* techniques.

Experiment 1 systematically compared a single-sentence preparation first proposed by Rachman, Shafran, Mitchell, Trant and Teachman (1996) to a multi-sentence distress induction procedure with a nonclinical sample of undergraduate participants (N = 64). The experiment was interested in determining which procedure was more effective in inducing distress (i.e. discomfort, anxiety and stress). Visual Analogue Scales (VASs) were used to measure changes in these dependent measures. We predicted that the multi-sentence preparation would generate greater distress. However, statistical analysis including a series of mixed between within analysis of variance (ANOVA's) demonstrated that the preparations were equally effective in inducing emotional distress.

The single-sentence distress induction procedure was employed again in Experiments 2-5 (N = 90). These studies also incorporated a number of brief analogue interventions derived from acceptance and commitment therapy (ACT). Put simply, the research question was: Would ACT interventions that targeted acceptance, defusion, values and contact with the present moment successfully ameliorate experimentally induced distress in a non-clinical

sample of undergraduates. We also investigated whether each of these individual ACT components would be enhanced by a *self as context* technique. Similar to Experiment 1, VASs were used to measure any changes in discomfort, anxiety and stress as a result of the interventions. We hypothesised that the combined interventions (e.g. self-enhanced acceptance) would reduce distress more effectively. However, a series of mixed between within ANOVA's demonstrated that all interventions, either stand alone components or combined with *self as context*, had little or no effect on levels of induced distress.

In Experiments 6-8, we employed an alternative form of distress induction to previous experiments with a nonclinical sample of undergraduate participants (N = 80). In Experiment 6 we investigated the impact of mindfulness versus self as context techniques in reducing distress (i.e. discomfort, anxiety and stress) in a non-clinical sample as measured on the VASs (N = 30). We did not make any specific predictions about the outcomes, but were concerned with the possibility of differentiated outcomes based on the fact that *self as context* techniques encourage a focus on *psychological* events (i.e. thoughts), while mindfulness techniques encourage a focus on *somatic* events (i.e. the body). A series of mixed between within ANOVA's demonstrated that both interventions were equally effective in reducing distress.

In Experiment 7, we distinguished between two mindfulness-based exercises, *physical* mindfulness and *verbal* mindfulness, and thereafter investigated which of these would be more effective in reducing distress (e.g. discomfort) in a non-clinical sample (N = 26) of undergraduates (as measured by the VASs). Again, we refrained from making specific predictions about potentially different outcomes for the two mindfulness-based components because there are no such experimental comparisons available in the research literature to date. A series of mixed between within ANOVA's demonstrated that both conditions reduced

distress as measured via VASs and the difference in distress levels prior and subsequent to intervention was statistically significant.

In Experiment 8, we turned our attention to an investigation of effects of sequence of mindfulness exercises and to the possibility that *combining* physical and verbal mindfulness exercises would enhance effects observed with either exercises individually. We hypothesised that the sequence which presented physical mindfulness *followed* by verbal mindfulness would show greater reductions in distress (as measured by the VASs) than the reverse because this is the format employed in most mindfulness-based therapeutic packages (e.g. Mindfulness-Based Stress Reduction). A series of mixed between within ANOVA's demonstrated that this prediction was upheld with our non-clinical sample of (N = 24), undergraduates and although both conditions resulted in reduced scores on all measures of distress, the physical-verbal sequence demonstrated superiority.

Experiments 9 and 10 employed the same distress induction procedure and a similar non-clinical sample of undergraduates as Experiments 6-8 in an effort to investigate the role of RFT in ACT exercises (N = 84). In particular, in Experiment 9 we investigated *distinction* and *hierarchical* relations when targeted specifically in a *self as context* exercise (N = 36). We hypothesised that the hierarchical *self as context* intervention would show superiority over the distinction *self as context* condition in terms of reductions in discomfort, anxiety and stress, based on previous research by Luciano et al. (2011). A series of mixed between-within ANOVA's demonstrated results that were consistent with this prediction as the hierarchical intervention was the more effective in reducing distress as measured by the VASs.

Experiment 10 attempted to explore this issue further using a different ACT exercise with undergraduate participants (N = 48). Participants were also exposed to a practice interval placed between two exposures to the distress induction task, to determine potentially lasting impacts of the interventions. A second aspect of the research examined the extent to which a

focus on the *self* played a specific role in the outcomes described above. Accordingly, Experiment 10 compared interventions that focused on participants' thoughts about a specific self-criticism (i.e. self-focused) versus interventions that focused on thoughts about an inanimate object (i.e. object-focused). We hypothesised that the self-based hierarchical intervention would be the most effective in terms of distress reduction (e.g. discomfort) because it aimed to target both self-specific content and hierarchical relations. This prediction was somewhat supported as statistical analysis demonstrated that both hierarchical conditions showed superiority in terms of distress reduction compared to both distinction conditions. Furthermore, both hierarchical conditions were associated with significantly less avoidance in the second exposure to the distress induction task.

In the General Discussion the current thesis discusses the implications of the research and extending the existing literature on experimental distress induction procedures, ACT, mindfulness and RFT.

Chapter 1
General Introduction

General Introduction

Contextual Behavioural Science (CBS) is a broad church that encompasses three core areas of knowledge. First, *functional contextualism* provides clear and pragmatic assumptions about the scientific agenda (Gifford & Hayes, 1999). Second, *relational frame theory* (RFT) identifies basic contextual elements that permit the prediction and influence of verbal behaviour (Hayes, Barnes-Holmes, & Roche, 2001). And third, *acceptance and commitment therapy* (ACT; Hayes, Strosahl, & Wilson, 1999) directly addresses the "challenge of the human condition" (Hayes, Barnes-Holmes, & Wilson, 2012). The challenge now faced by the CBS community is to draw these three strands into a broad, scientific and coherent agenda. This is not an easy feat and has rarely, if ever, been successfully achieved in the history of psychology. But as a starting point, Hayes et al. (2012) suggested the following model for how this might be achieved:

> a reticulated (that is, web-like) model of scientific and practical development, in which theoretical and technological progress occurs at multiple levels but in an interconnected way, with differing standards of progress appropriate to the particular level of the work (p.6).

The integration of RFT and ACT is central to the CBS reticulated model and the programme of research it promotes and relies upon. For example, RFT scholars are often asked by ACT clinicians for RFT-based definitions of cognitive fusion. Because the concept of fusion is pivotal to ACT assumptions and practices, and because RFT is after all an account of language and cognition, this might seem like a simple question indeed. However, an RFT translation of fusion (and all other ACT concepts) is still a long way off for various reasons. First, the necessary experimental procedures are not yet developed. Second, basic research is slow and labour intensive, and is often too slow for the demands of clinical development and progress. Third and perhaps most importantly, ACT-based concepts are

middle level terms that do not yield readily to scientific scrutiny. We will return to this final point towards the end of the current chapter.

Although the description of the reticulated model is a recent development for CBS, it comes on foot of a wealth of basic research on RFT and a host of mostly outcome studies on ACT. A brief summary of the history of RFT research allows one to see where the reticulated model is currently at. According to Foody et al. (under review), the *first generation* of RFT research saw the development of the core concept of arbitrarily applicable relational responding and identification of the basic relational frames (i.e. co-ordination, distinction, opposition and comparison), as well as the defining features of the frames, such as: mutual entailment, combinatorial entailment and the transfer/transformation of stimulus functions (Hayes et al., 2001). The *second generation* of research marked the expansion into more complex relations and relational networks, such as: analogy (e.g. Stewart, Barnes-Holmes, Roche, & Smeets, 2001); perspective-taking (e.g. McHugh, Barnes-Holmes, & Barnes-Holmes, 2004); and rule-governance (e.g. O'Hora, Barnes-Holmes, Roche, & Smeets, 2004). The *third generation* contained the beginnings of the integration of RFT with ACT through componential analyses of therapeutic components (e.g. Gutiérrez, Luciano, Rodríguez, & Fink, 2004), experimental analogues of de/fusion (e.g. Keogh, 2008) and applications of the perspective-taking protocol with clinical populations (e.g. Villatte, Monestès, McHugh, Freixa i Baqué, & Loas, 2008).

Although the volume of research is simply staggering for such a young scientific field (approx. 260 studies have been published from labs at Reno and Maynooth alone), a great deal has yet to be learned. One might argue therefore that we are now at a new research crossroads at which these three research waves do not appear to answer our current questions about how to translate ACT into the language of RFT, while adhering to functional contextualism (e.g. by creating a functional definition of fusion). Hence, Foody et al. (under

review) have argued, that the community is on the cusp of a *fourth generation* of RFT research, part of which aims specifically to define concepts that are central to ACT (Foody, Barnes-Holmes, & Barnes-Holmes, 2012).

The current programme of research is the beginning of this generation of work. The two sections that follow in the current chapter contain summaries of ACT and RFT, respectively, before proceeding towards a recent account of the integration of these two strands in terms of understanding a sense of self as relational responding and identifying the processes through which this might be embraced in ACT.

Acceptance and Commitment Therapy

Acceptance and commitment therapy is one of the third wave behaviour therapies that has been applied across the full range of mental health problems (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Indeed, its breadth of benefits is now well established in the clinical literature with positive outcomes reported in: diabetes self-management (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007); weight control (Lillis, Hayes, Bunting, & Masuda, 2009); obsessive compulsive disorder (Twohig, Hayes, & Masuda, 2006); depression (Zettle & Hayes, 2002); chronic pain (Wicksell et al., 2005); and psychosis (Bach & Hayes, 2002). The breadth of application, and perhaps success, of ACT stems from the fact that the approach is based on a set of generic principles regarding human verbal behaviour that may be summarised as: emotional acceptance vs. avoidance; cognitive and emotional fusion vs. defusion; values-directed action; and the importance of a flexible sense of self.

ACT processes. ACT is distinct from other behaviour therapies because of an underlying heuristic model (referred to as the 'hexaflex') that articulates conceptually specified and testable middle level processes (see Figure 1; see also Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Such a model with operationally definable behavioural processes

that have the potential for individual sources of empirical support (e.g. in componential analyses) would be the ideal bridge between basic science and clinical practice. Ideally, models should be dynamic in order to permit on-going adjustments to both science and clinical practice (i.e. the therapy poses questions for the science and the science validates therapeutic techniques or dictates technical adjustments). There should also be synergy among individual components and all processes should be consistent with the model's underlying theoretical and philosophical assumptions. In the case of ACT, the model must be contextual, functional and behavioural. Each of the model's component processes in the hexaflex is summarised below.

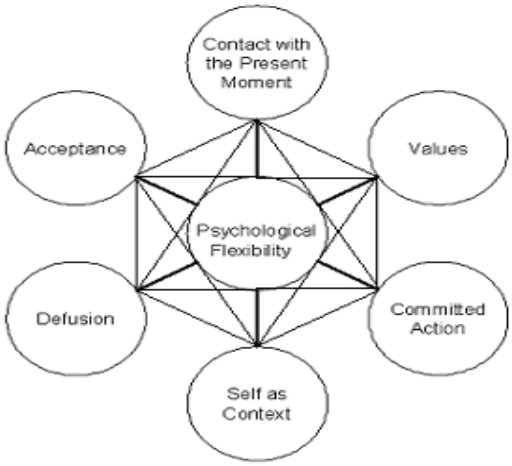


Figure 1. The hexaflex model of the psychological processes ACT seeks to strengthen, as taken from Foody et al. (2012).

Psychological flexibility. There is empirical evidence to support the view that behavioural *inflexibility* is associated with many forms of mental distress (e.g. Bond & Flaxman, 2006; Bond, Flaxman, & Bunce, 2008; Vowles & McCracken, 2010). In addition, *flexibility* is also a well-established behavioural term (Skinner, 1984). Hence, it is not surprising that psychological flexibility rests at the centre of a behavioural hexaflex of mental health.

From an ACT perspective, psychological flexibility is in principle both a process and an outcome. In practice, however, it is more likely the former because you are unlikely to ever reach a point at which you have acquired maximum flexibility in any skill. According to Hayes et al. (2006), psychological inflexibility is the "*inability to persist in or change behaviour in the service of long-term valued ends*" (p.6), which results from verbal behaviour interacting with, and often over-riding, direct contingencies.

Verbal behaviour often dominates contingency-shaped behaviour through the operation of verbal rules and rule-following has a long history in the literature on psychological suffering (Torneke, Luciano, & Valdivia, 2008; Zettle & Hayes, 1982). Specifically, mental distress is often characterised as *excessive* rule-following, at the expense of making contact with direct contingencies. From an ACT perspective, Plumb, Stewart, Dahl and Lundgren (2009) have argued that mental health involves flexibility between rule-following and contingency sensitivity in a way that maximises consistency between values and behaviour.

Acceptance. A focus on acceptance is not unique to ACT and is a central tenet of numerous contemporary treatment approaches (e.g. dialectical behaviour therapy, DBT; Linehan, 1993). There is considerable empirical support for the utility of acceptance, according to ACT, when investigated in both experimental (e.g. Hayes, Bisset et al., 1999) and clinical contexts (e.g. Bach & Hayes, 2002). Specifically, higher levels of acceptance have been associated with less depression (e.g. Polusny, Rosenthal, Aban, & Follette, 2004) and anxiety (e.g. Stewart, Zvolensky, & Eifert, 2002), as well as increased tolerance of chronic pain (e.g. McMullen et al., 2008).

According to Levin and Hayes (2009), the ACT definition of acceptance is as follows:

> the active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm (p.15).

This particular definition implies the importance of accepting all that exists in one's history and all that occurs physically and psychologically in the present moment.

Defusion. Although it derives from the cognitive concept of *distancing* (Zettle & Hayes, 1987), the term defusion is unique to ACT. Many ACT outcome studies that have shown positive results include defusion techniques (e.g. Bach & Hayes, 2002; Hayes et al., 1999). And several componential analyses have also demonstrated the utility of defusion in experimental settings (e.g. Healy et al., 2008). For example, Masuda et al. (2009) demonstrated that the defusion generated by the rapid repetition of the words of a self-relevant negative thought reduced the thought's believability and its emotional discomfort in a non-clinical sample of undergraduates.

In spite of this positive outcome evidence, defusion remains one of the most difficult concepts in ACT to operationally define. In short, defusion is the undermining or unravelling of cognitive/emotional fusion, which is itself another difficult concept to define. Hayes et al. (2006) defined fusion as:

> excessive or improper regulation of behaviour by verbal processes, such as rules and derived relational networks. . . . guided more by relatively inflexible verbal networks than by contacted environmental contingencies. As a result, people may act in a way that is inconsistent with what the environment affords relevant to chosen values and goals. (pp. 6-7).

According to this view, defusion techniques facilitate a reduction in the literal functions transformed by thoughts, thereby reducing the extent to which those thoughts appear to the individual to be literally true (Fletcher & Hayes, 2005). In support of this suggested process, findings reported by Masuda et al. (2009) indicate that defusion techniques do reduce the believability of thoughts.

Values. Similar to acceptance, a focus on values is also not unique to ACT. For example, values play a prominent role in Rogerian humanistic approaches (Rogers, 1964) and are also prevalent in the Positive Psychology Movement (Seligman & Csikszentmihalyi, 2000). Numerous studies support the efficacy of ACT-based values clarification techniques in

both experimental (e.g. Paez-Blarrina et al., 2008a) and clinical contexts (e.g. McCracken & Yang, 2006). For example, Paez-Blarrina et al. (2008b) compared a values-based ACT protocol with a no-values protocol on electric shock tolerance and reported increased tolerance and reduced believability of pain-related thoughts in the former but not the latter.

According to Hayes et al. (1999), values are defined as: "*verbally constructed, global, desired and chosen life directions*" (p.206) and verbally constructed future reinforcers. Values, therefore, provide an alternative source of behaviour regulation than fusion and avoidance (Fletcher & Hayes, 2005). Values exist in networks with higher order consequences, middle level goals (in the service of these consequences) and concrete actions that are driven by these goals. Valued living, therefore, involves high levels of value-behaviour consistency. For ACT, values are almost entirely conceptualised as process (rather than outcome) variables, because an individual cannot readily reach a point at which a value is fully achieved (e.g. being a good partner; see Blackledge & Barnes-Holmes, 2009). Values are also highly personalised in ACT.

Committed action. Committed action is necessary for the attainment of values in the sense that values direct behaviour. Specifically, you can only move in the direction of your values if you achieve the short-, medium- and long-term goals in which your values are manifested through specified committed actions (Fletcher & Hayes, 2005). It is hardly surprising that a behaviour therapy such as ACT places a strong emphasis on overt action. But from an ACT perspective, the core issue is that this action must be consistent with overarching personal values and less influenced by current psychological content or contextual demands.

Contact with the present moment. A focus on attending to the present moment is also not unique to ACT and is, of course, pivotal in mindfulness-based therapies. For example, Baer, Smith and Allen (2004) have suggested that mindfulness comprises four key

behavioural components: observing; describing; acting with awareness; and accepting without judgement. Kabat-Zinn (1994) proposed that a critical element of mindfulness involves paying attention in a particular way, and indeed the broad psychological concept of attention is often used synonymously with mindfulness (Baer & Krietemeyer, 2006; Bishop et al., 2004; Brown & Ryan, 2003).

In a similar vein, Hayes et al. (2006) have proposed that mindfulness is comprised of four of the six hexaflex processes, namely contact with the present moment, self as context, acceptance and defusion. However, some sources have postulated a more direct link between mindfulness and contact with the present moment. For example, Fletcher and Hayes (2005) defined contact with the present moment as shifting attention to what is happening in the here-and-now and *"contacting both internal stimuli, such as bodily sensations, thoughts and feelings and external stimuli, such as sounds, sights, smells and touch"* (pp. 320-21).

Self as context. The concept of self as context is unique to ACT and was initially one of the three selves (along with *self as content* and *self as process*; see Hayes, 1995). Self as context involves adopting a perspective from which a coherent sense of self is greater than (and distinguishable from), your thoughts, feelings and emotions (Flaxman & Bond, 2006). In short, self as context involves reductions in categorising and evaluating your psychological content as yourself. As a result, however, it is difficult to distinguish self as context from defusion.

There is limited empirical evidence to support self as context as an individual component. However, one notable study by Williams (2006) reported lower scores on a post traumatic stress disorder (PTSD) scale for war veterans who received all phases of ACT, relative to those exposed to an ACT protocol in which the self as context component was absent. We will return to self as context and the three selves below in more detailed discussions of the ACT and RFT approaches to self.

Relational Frame Theory

Relational frame theory draws mainly on the concept of derived multiple stimulus relations and a process called *arbitrarily applicable relational responding* in its attempts to provide a contextual, functional, behavioural account of human language and cognition. This process, as argued by RFT, underlies many of the basic phenomena that comprise human language and cognition, including: naming; storytelling; metaphor; deception; humour; and perspective-taking (Hayes et al., 2001).

The theory is based on the fact that most living organisms, when trained, can respond to relations among the physical properties of two or more types of stimuli. This behaviour is referred to as *non-arbitrary responding* (Hayes, Fox et al., 2001) and has been readily demonstrated with human participants (e.g. Reese, 1961), as well as with different species of animals and birds (e.g. Harmon, Strong, & Pasnak, 1982; Towe, 1954). What RFT adds to these repertoires is an account of how humans can also respond to *arbitrary* stimulus relations in a process known as arbitrarily applicable relational responding (also known as *relational framing*, see Barnes, 1994). In short, human verbal abilities allow them to respond to relations among stimuli that are not defined by their physical form, rather by additional contextual cues. For RFT, this contextually controlled relational responding results from a history of multiple exemplars from early natural language interactions (Luciano et al., 2009).

Learning to name different objects through natural language is one of the earliest forms of arbitrarily applicable relational responding (Barnes, 1994). During these interactions, a child is taught to respond bi-directionally. Consider the example of a parent holding up a ball and saying “ball”. For RFT, this interaction comprises an object-name relation. If the child then looks at the ball when the parent says “ball”, this comprises a name-object relation (a reverse of the previous relation). Although during early language interactions, each type of relation will be explicitly trained, across multiple exemplars deriving the same relations with

novel stimuli becomes possible (Barnes). For example, if a parent points to a child's shirt and says "this is your shirt" (object-name relation), the contextual cue 'is' and the naming context itself allow the child to later select the shirt when asked "where is your shirt" (name-object relation), without direct reinforcement.

The existing empirical evidence on RFT has identified many different relational frames, but all have the same three defining properties of: mutual entailment, combinatorial entailment and the transformation of stimulus functions. *Mutual entailment* describes the relations that occur between two stimuli or events. For example, if stimulus A is explicitly established as equal to stimulus B, then a relation between B and A may also be derived (e.g. if A = B then B = A). However, not all mutually entailed relations are equivalent. Consider a trained relation in which A>B, then the correct derivation of the B-A relation is B<A (not B=A). *Combinatorial entailment* describes relations that occur among three or more stimuli. For example, if one is explicitly trained in the relations A≥B and B≥C, then the relations A≥C and C≤A can be derived.

The final defining feature of a relational frame is the *transformation of stimulus functions.* Consider the following example. If an individual is explicitly taught to relate B as opposite to A and A is then given a conditioned punishing function, one would predict that B would acquire a derived reinforcing function, based on the opposition relation with A. This very specific transformation of stimulus functions based upon derived stimulus relations is exactly what numerous RFT studies have demonstrated (e.g. Dymond, Roche, Forsyth, Whelan, & Rhoden, 2008). It is a critical feature of relational framing and lies at the very heart of RFT. A number of different relational frames are described briefly in the section that follows.

The relational frame of co-ordination. The examples above all involved relations of co-ordination or equivalence. And co-ordination appears to be the most basic frame that

infants come into contact with through natural language interactions, and may be the basis on which other frames are established (Lipkins, Hayes, & Hayes, 1993; Luciano, Gómez-Becerra, & Rodríguez-Valverde, 2007). This frame requires an individual to respond to contextual cues such as "is" ("is the same as", "equals", etc.), which control the derivation of the co-ordination relations. In simple terms, "is", for example, specifies that two stimuli are arbitrarily co-ordinated. Consider experimental trials presented by O'Connor, Rafferty, Barnes-Holmes and Barnes-Holmes (2009) who successfully employed multiple exemplar training (MET) to establish co-ordination relations in 15 children with ASD and three typically-developing children. Participants were trained to establish co-ordination relations among words, their related objects and their related pictures, using nameable and familiar stimuli. Training AB relations established mutually entailed relations between the written words (A stimuli) and pointing to objects (B stimuli). This was followed by BC training (i.e. see objects, point to pictures). The combinatorial entailment (equivalence) tests involved the AC and CA relations (i.e. see word-point to picture; and see picture-point to word). The results demonstrated that MET successfully facilitated co-ordination responding on a novel set of stimuli with six out of eight children. In addition, the findings suggested a relationship between verbal ability and training requirements, such that participants with lower verbal ability required more exposures to explicit training of the target co-ordination relations. Several other studies have also explored co-ordination relations. For example, Barnes-Holmes, Barnes-Holmes, Smeets and Luciano (2004) demonstrated the derived transfer of happy and sad mood functions through co-ordination relations in a sample of 16 adults. Carr, Wilkinson, Blackman and McIlvane (2000) also established co-ordination responding in low-functioning individuals who showed deficits in these repertoires.

The relational frame of opposition. The frame of opposition involves arbitrarily applying the relational cue "is the opposite of" or its equivalent along a specific dimension

(e.g. hot *is the opposite of* cold). Consider research by Barnes-Holmes et al. (2004) who successfully employed MET to establish opposite relations in three typically-developing children. The basic experimental trial required the child to select the most valuable coin/s (from four possible options). Consider the following instruction: "Coin A buys many and A is opposite to B and B is opposite to C and C is the opposite to D". Explicit training and increasingly complex testing (e.g. where the coins were presented randomly) continued until participants were responding to trials with 10-coin sequences. Several other studies have also investigated this relational frame. For example, Dymond et al. (2008) demonstrated the derived transfer of avoidance functions in accordance with opposite relations, while Whelan and Barnes-Holmes (2004) demonstrated the transfer of a punishing function.

The relational frame of distinction. The relational frame of distinction involves responding to arbitrary differences among stimuli. Like opposition, distinction involves responding to the relational cue "is different from" (e.g. men *are different from* women). Unlike opposition, however, distinction relations often do not specify the relevant dimension. For example, if you are told that 'men are different from women', it is unclear what these differences are. Several RFT studies have investigated this type of relation. For example, Roche and Barnes (1996), and Steele and Hayes (1991) established responding in accordance with distinction relations in teenagers and adults.

The relational frame of comparison. The comparative frame involves responding to one event in terms of a quantitative or qualitative relation along a specified dimension with another event. Comparative frames may be divided into specific sub-types, such as bigger-smaller, brighter-darker, etc. The different types are, in part, defined by the dimension along which the relation applies (e.g. size or speed). Comparative frames may also involve quantification of the dimension (e.g. 'A is more than B and B is more than C'). Consider experimental trials presented by Barnes-Holmes, Barnes-Holmes, Smeets, Strand and Friman

(2004) who successfully employed MET to establish comparative relations in three typically-developing children. Training AB relations involved selecting the coin (from two possible options) that bought more sweets. Consider the following instruction: "Coin A buys less than coin B, so which coin would you take to buy as many sweets as possible"? Training BC relations was identical, but now compared coin B with a new coin C. Training ABC relations then involved all three coins. Consider the following instruction: "If coin A buys less than coin B and if coin B buys less than coin C, which coin would you take to buy as many sweets as possible"? This was followed by an ABC test with novel stimuli. The results demonstrated that MET was a useful way to establish comparative relations and related generalisation in young children. Berens and Hayes (2007) reported similar outcomes with typically-developing children.

The relational frame of hierarchy. Hierarchical relations involve responding in accordance with contextual cues such as "contains", "is a member of" or "belongs to" or equivalent. The general form of a hierarchical relation is "A is an attribute or member of B" and kinship relations are a classic example. For instance, if you are told that John is the father of Dave and Claire, you can derive that Claire and Dave are siblings. Two RFT studies have examined hierarchical relations with adults (Gil, Luciano, Ruiz, & Valdivia-Salas, 2012; Griffee & Dougher, 2002). In particular, Luciano et al. successfully demonstrated the transformation of functions among members of hierarchical categories using MET in a sample of university students.

The relational frame that appears to be perhaps the most complex and which has attracted much empirical interest involves perspective-taking relations. This frame will be reviewed in considerable detail below in the following section on self. Prior to doing so, however, short reviews of the traditional psychological literature on self and on the role of self in human suffering will be provided.

The Psychology of Self

The concept of self has had a pivotal role in psychological knowledge and theorising from their earliest beginnings (e.g. James, 1910; Mead, 1934; Sarbin, 1952). This prominent position has continued in spite of a long-standing lack of consensus on the concept's core definition and a diversity of emphases on specific proposed features (Epstein, 1973). For example, Skinner (1974) emphasised self-awareness as produced by social contingencies that reinforce discrimination of a human or animal's own behaviour (see also Dymond & Barnes, 1997). Alternatively, Erikson (1968) proposed the emergence of a conscious sense of self in childhood. Even these approaches, however, are not necessarily contradictory because both a conscious self and self-awareness refer to self-knowledge that has an essential quality of being *on-going* and which facilitates a more stable knowledge base about who we are (Farb et al., 2007; James, 1890).

One of the few core features of a sense of self on which most psychological traditions agree is perspective-taking. In short, this involves the ability to see the world consistently and coherently from one's own perspective, as well as to appreciate the perspective of others. In mainstream psychology, most recent theorising and research on perspective-taking has come from a school of thought known as *Theory of Mind* (ToM: Baron-Cohen, Tager-Flusberg, & Cohen 2000; Howlin, Baron-Cohen, & Hadwin, 1999).

Theory of Mind. Theory of Mind has been loosely defined as "the appreciation of the representational nature of mind and its relation to behaviour" (Suddendorf & Fletcher-Flinn, 1997, p.169). Perspective-taking is commonly viewed as a central feature of one's ability to have a theory of mind of oneself or another and thus forms the underlying component of such a representational understanding. Specifically, traditional developmental psychologists have defined perspective-taking as an individual's awareness of informational states in oneself and in others (Baron-Cohen, 1995; Premack & Woodruff, 1978). The basic processes that

underpin theory of mind capabilities are thought to involve an individual understanding the relationship between his/her beliefs and actions and the beliefs and actions of others (McHugh, Barnes-Holmes, & Barnes-Holmes, 2009). According to Baron-Cohen (2000), an individual has well-developed theory of mind skills when s/he displays "the ability to infer or attribute to oneself and others the full range of mental states (i.e. beliefs, desires, intentions, imagination, emotions, etc.) that cause action" (p.3).

In the language of ToM, there are five levels in the development of the attribution of information or mental states to the self and others that range from simple visual perspective-taking to the more complex level of distinguishing between true and false beliefs (Howlin et al., 1999). Level 1 of the ToM model consists of *simple visual perspective-taking* at which individuals are believed to act on the principle that different people can have different views of the same situation. For example, with a two-sided card placed between two individuals, one person can see only one side while the other person can see the other side. Level 2 involves *complex visual perspective-taking* and is based on the principle that people can see things differently. For example, if a picture is placed between two individuals sitting opposite one another, the picture will appear upside down for one individual and the right way up for the other. These two levels are collectively known as *first-order false belief* (Baron-Cohen, 2000). Most of the studies concerned with these stages of ToM have investigated the developmental differences between normally-developing and autistic children. In general the findings demonstrated that the latter population show higher rates of deficits in first- order false belief, while the former do not (e.g., Baron-Cohen, Leslie, & Frith 1985; Leekam & Perner, 1991; Swettenham, Baron-Cohen, Gomez, & Walsh, 1996).

The next three levels of perspective-taking (Levels 3-5) are believed to be more complex as they require the individual to move from purely visual perspective-taking to understanding the relationship between seeing and knowing (McHugh et al., 2009). At Level

3, individuals are said to understand that *seeing leads to knowing,* based on the principle that people only know things they have seen (Taylor, 1988). This ability also precludes an understanding of deception because an individual who cannot keep track of what another person knows is unlikely to determine whether the other person is being truthful or not. Consider the example by Pratt and Bryant (1990), who presented young children with a story about two characters, one of whom looks into a box and another of whom simply touches the box. After the story, the three old children were asked to identify the character who knew what was inside the box. All of the children were able to correctly identify that the character who had seen inside the box would know what was inside, while that the character who simply touched the box would not know.

Level 4 of this model involves the principle that actions can be predicted on the basis of true belief (Howlin et al., 1999). Consider a traditional training task in which two similar scenes are portrayed. In one scene, a toy car is placed beside a toy boat, and in the other scene, an identical toy car is placed beside a toy plane. The child is then presented with the following true belief story: "This morning, you saw the car next to the boat but you did not see the car next to the plane". The child is then asked, "Where do you think the car is? Why do you think it is near the boat? Where will you go to get the car? Why will you go to the boat?" The correct conclusions involve the knowledge that one will only know what one has seen, and will act on this basis. In short, in both levels 3 and 4, individuals learn that they and others can only determine a true belief on the basis of what is actually seen and they cannot know what they have not seen, even if they think they know what they have seen (McHugh et al.).

The final Level 5 involves the principle that you can predict actions on the basis of false belief and can become aware that previous beliefs may have been false (Howlin et al.). This refers to a scenario where representations or beliefs are discriminated as incorrect or

false (e.g. events may have occurred without a person's knowledge) and the individual has the ability to then alter their belief about these events.

Empirical evidence suggests that children do not demonstrate perspective-taking until they reach certain developmental milestones. For example, Baron-Cohen, Tager-Fusberg and Cohen (2000) exposed children to the five levels of TOM understanding and found competencies only around age five. Deficits in ToM (often referred to as 'mindblindness') also appear to correlate with key characteristics of Autistic Spectrum Disorder (ASD) and cognitive developmental theorists have postulated that 'mindblindness' in certain populations supports the core concepts of ToM (Baron-Cohen, 1995). Similarly, although great apes and very young children appear to have some understanding of their own and others' emotional states (such as desire or hurt), they cannot attribute informational states (knowledge or belief) that provide the specific context for these emotions to occur (Whiten & Byrne, 1997).

The Role of Self in Human Suffering

The emergence of a sense of self is a largely assumed pre-requisite for sound mental health and human functioning (Dymond & Barnes, 1997; Hayes, 1984). And clinical researchers have often argued that dysfunctional aspects of self are associated with, and contribute to, poor mental health. Authors differ markedly on whether they interpret this dysfunctionality as deficits, excesses, or problems pertaining to flexibility.

Self-awareness, in which we display on-going watchfulness over our own thoughts, actions and emotions (Duval & Wicklund, 1972) has played a strong role in the literature on human suffering. Specifically, authors such as Ingram (1990) have highlighted the importance of synchronising one's attention appropriately with one's environment. In line with this, Ingram distinguished attention that is focused on self-referential internally generated experiences (called *self-focused attention,* SFA) vs. external experiences derived

through sensory receptors. Along similar lines, Watkins and Teasdale (2004) distinguished between analytical self-focus and experiential self-focus. Indeed, there appears to be considerable overlap between experiential self-focus and an external experience of self, as well as between analytical self-focus and SFA.

Cognitive theories have generally proposed that *excessive* self-focus (presumably too much analytical at the expense of experiential) is associated with mental distress. For example, Mor and Winquist (2002) suggested that *chronic* self-focus, particularly after negative events, contributes to mental health problems (see also Duval & Wicklund, 1972; Lyubomirsky & Nolen-Hoeksema, 1993). Ingram himself (1990) suggested that heightened SFA may contribute to the full range of human suffering, including anxiety, substance abuse and schizophrenia. Indeed, a number of sources of evidence support this view. For example, increasing the level of engagement in SFA in dysphoric participants correlates with more pessimistic expectations for the future (Pyszczynski, Holt, & Greenberg, 1987), as well as increased memory of negative events in the past (Pyszczynski, Hamilton, Herring, & Greenberg, 1989). Similar relationships have been recorded between heightened SFA and the symptoms of anxiety (Clark & Wells, 1995; Hartman, 1983; Hope, Gansler, & Heimberg, 1989). Similarly, Watkins and Teasdale (2004) demonstrated that heightened analytical self-focus was associated with increased risk of a depressive relapse in individuals diagnosed with depression (see also Crane et al., 2008; Rimes & Watkins, 2005).

In a view of human psychological dysfunction as behavioural deficits, Linehan (1993), in the dialectical model of personality disorder, proposed that sufferers demonstrate *deficiencies* in taking the perspective of others and in emotional self-regulation (see also Dimeff & Linehan, 2001). Furthermore, other authors have offered perhaps a more complex and fluid approach that sees dysfunction not simply as excesses or deficits, but as an inability to behave flexibly. For example, Ingram (1990) also proposed that psychological suffering

resulted from an inability to shift attention or perspective appropriately between internal and external experiences. Taken together, these views present a picture of mental distress as imbalances in the functioning of a sense of self that have both cognitive and emotional ramifications.

Although behavioural psychologists traditionally paid little attention to the role of self (even in verbal behaviour) and also showed sparse interest in psychological distress beyond developmental disabilities, behavioural flexibility is a well-established concept. From a behavioural perspective, the inability to shift perspective appropriately between experiential and analytical self-focus is an example of a lack of behavioural flexibility under appropriate stimulus control. Consider the following example. An individual who suffers from chronic pain bumps his elbow (experiential self-focus). He instantly has the thought that this might need to be watched in case it becomes something serious (analytical self-focus). This latter internal source of experience brings the individual into contact with a difficult history of chronic pain and all its ramifications (more analytical self-focus). In this context (which is largely unavoidable), it would be better for the sufferer to switch back to experiential self-focus, rather than engage in further lengthy and painful analytical self-focus, in order to ensure that the latter does not quickly get the better of him. Too much analytical self-focus at this point will lead him undoubtedly to excessive rumination about his internal states, at the expense of attending to more on-going actual experience. It is not that the sufferer is somehow better at analytical than experiential self-focus. He can do both competently. The problem is that he cannot switch between the two when this is most needed, because analytical self-focus generates more of the same, rather than facilitating switching back.

Research on the *contingency insensitivity effect* illustrates how excessive verbal behaviour (such as analytical self-focus) reduces your discriminations of external contingencies (such as experiential self-focus) and thus directly influences your subsequent

behaviour. This effect, therefore, offers an excellent example of the behavioural implications of a lack of flexibility, especially where verbal behaviour dominates that which is based directly on contingencies (Wulfert, Greenway, Farkas, Hayes, & Dougher, 1994). The next section reviews the ACT model of psychological health and distress, in which both behavioural flexibility and self occupy central positions in terms of understanding and clinical intervention.

The ACT Approach to Self: The Three Selves

From an ACT perspective, self was initially conceptualised in terms of the three selves -- self as content, self as process and self as context. Collectively, these have also been referred to as: three *levels* of self, three *senses* of the concept of self and three *knowing* selves. All are believed to be natural by-products of verbal behaviour (Hayes, 1995). The term 'three senses of self' is used predominantly in the sections that follow.

Self as content. Put simply, self as content involves describing and/or evaluating yourself (i.e. creating verbal statements about yourself and evaluating these statements). In this conceptualised self, your individual world is structured by the literal meaning of your psychological content, such that who you are is interpreted in terms of what your mind tells you at various times. From an ACT perspective, this literality is problematic (Hayes et al., 2006). To illustrate this point, one might simplify this behaviour into several steps. First, there is nothing inherently wrong with describing and/or evaluating yourself, whether these evaluations are positive or negative. Second, a problem begins to emerge when any aspect of your content becomes co-ordinated with who you are. This co-ordination relation (between content and I/self/observer) is often referred to as *attachment,* because the piece of content in question is attached to "I", as a human being. Attached content automatically becomes part of the conceptualised self.

According to Torneke (2010), self as content "*is, by necessity, an extreme simplification. This is its very point and at the same time a limitation*" (p.110). In other words, self as content is an extreme simplification of all that the self is in the sense that there should be much more to the self than what the self as content suggests at any particular point in time.

Self as content in therapy. From an ACT perspective, clients often come to therapy with a conceptualised self, which they want to change or swap for another (more, better, different) conceptualised self (Hayes et al., 1999). As such, they are open to change on specific features of their self and their content, but unfortunately are often wedded or attached to the construction of the conceptualised self as a generic strategy. Indeed, this strategy and the conceptualised self as a whole are often ardently defended by clients early on. In the language of ACT, they struggle with this relationship between self and content, and struggle with conceptualising the self as a strategy. It is in respect of this struggle and with reference to the ossified conceptualised self that the koan-like phrase: "Kill yourself everyday" has been used (Hayes, 2002).

Self as process. Self as process is a psychological space in which on-going activity facilitates continuous distinctions between the observer and the doer. In short, who you are is distinct from what you think, feel, remember, etc. For ACT, this psychological space does not entail fusion, because the observer can perceive the processes of thinking, feeling, etc. (the doings) and the evaluations that accompany them. Naturally, this distinction has the potential to reduce the pain associated with those evaluations (i.e. the observer wouldn't feel as overwhelmed as when in self as content).

The *on-going awareness* of those content-based processes is a critical feature of self as process. In essence, because you can perceive your content as continuously changing, attachment to it is not facilitated. Consider the example "I feel depressed and am having depressed thoughts, but these are just thoughts and feelings at this moment and they may be

different tomorrow". This on-going awareness is synonymous with the concept of mindfulness, because you are being mindful of your content as it comes and goes.

Operating in self as process readily permits values-consistent behaviour, rather than content-driven behaviour, because you have a distinct awareness of your content, while remaining open to values. In simple terms, self as process permits both, thereby allowing you greater flexibility with regard to your actions. Hence, you *can* live a rich and full values-based life if you can see your content for what it is. Notice, however, that self as process does not require you to somehow be 'content-free' (if that were even possible), but simply offers you a different place from which to observe the ever-changing nature of your content.

On balance, it is also important to recognise that *sticky* psychological content (with which you have struggled in the past) is likely to create resurgence to self as content. That it, you cannot assume that all you need to do is stay in self as process, because your history will likely dictate that certain powerful content will slide you back into self as content, the minute it shows up. Accordingly, for ACT, there is a very fine line between self as content and self as process, and it is primarily on-going awareness that keeps you in the latter and away from the grasp of the former.

Self as process in therapy. Learning to experience what is happening to us on an on-going basis is a critical feature of our developmental histories, but there are many examples of how difficulties can emerge when this training history is problematic. In short, our experiences must be co-ordinated with descriptors that are consistent with the verbal world around us and problems emerge when they are not. For example, a client may not have appropriate breadth in using emotional terms to describe current feelings (Barnes-Holmes, Hayes, & Dymond, 2001). Hence, a core feature of ACT is to establish self as process skills and facilitate maximum co-ordination between the descriptors the client employs and those used by the verbal community. Doing so also allows the therapist to gain better insight into

how clients actually feel and what is happening for them in the moment. This, in turn, will permit a better understanding of how these descriptors feed self as content and thus foster a better understanding of the conceptualised self as constructed by an individual. Furthermore, facilitating self as process allows greater flexibility in shifting between self as process and self as context, thus making self as content less likely.

Self as context. Self as context is a psychological space in which there is the strongest distinction between the observer and his/her psychological content. For ACT, operating in self as context involves detachment (defusion) from your psychological content because who you are is distinct from what you think, feel, remember, etc. Consider the following example, "I feel depressed and am having depressed thoughts, but I know that who *I* am is more than these negative thoughts and feelings". Naturally, this distinction has the potential to reduce the previous pain associated with content and its evaluations (i.e. the observer wouldn't feel as overwhelmed as when in self as content). The following quotation from Hayes (1995) offers a nice definition of this sense of self:

> *I* in some meaningful sense is the location that is left behind when all of the content differences are subtracted out (p.3).

Self as context in therapy. In a therapeutic context, ACT attempts to increase the extent to which clients engage in self as context, largely through experiential exercises (e.g. the Observer Exercise). Doing so, in turn, weakens the control of thoughts and feelings over behaviour (Barnes-Holmes et al., 2001). Consider the example of an individual presenting with chronic pain. Training in self as context would permit the client to experience a sense of self that is distinct from the pain, as well as highlighting the fact that other experiences can co-exist with pain. When the client learns to make more contact with this sense of self, it also increases her access to values, as a dominant source of behaviour, and a greater sense of self as context will allow her to consistently keep this behaviour going in that valued direction.

Self as context will also foster greater acceptance by her because it opens up a safe place in which pain can be experienced as not completely overwhelming or dominant. As a result, she comes to see the pain as a part of who she is, but not *all* that she is.

The RFT Approach to Self: Perspective-taking Relations

Perspective-taking as deictic relations is one of the most widely studied areas of relational responding, as dictated by RFT (e.g. McHugh et al., 2004). Evidence supporting this concept has emanated from studies on both development and education with typically-developing children, as well as those with developmental disabilities (e.g. autism) and other psychiatric diagnoses (e.g. Asperger's syndrome). However, recent developments have also examined the potential role of relational perspective-taking in other diagnostic samples, such as schizophrenia, and have explored the role of perspective-taking in one's sense of self.

For RFT, perspective-taking is comprised of three types of derived stimulus relations, known as I vs. YOU, HERE vs. THERE and NOW vs. THEN. Put simply, these describe the three core aspects of your perspective. First, I see the world as I, not as YOU or as someone else (hence, we say, I *versus* YOU). Second, when I see the world as I, I always see it from HERE, not from THERE, or anywhere that is not HERE (hence, we say, HERE *versus* THERE). Third, when I see the world as I, I always see it from NOW, not from THEN, or some other point in time that is not NOW (hence, we say, NOW *versus* THEN). In summary, I always see my world from HERE and NOW and from my perspective, and I always see YOU from THERE and THEN.

I versus YOU. When we operate from the perspective of *I*, we distinguish, compare and contrast ourselves to others across a myriad of dimensions. As children, we learn to do this initially through physical attributes (e.g. mummy is taller than me, but daddy is taller than her). Harmless as these may seem, the fact that we can already compare and contrast

ourselves with others means that we can also evaluate these comparisons. Consider, for example, Ann who has always felt inferior to her more attractive sister Mary. In relational terms, Ann's perspective holds that Mary is more physically attractive than Ann and more attractive equals better, hence Mary is also better than Ann. Although the initial comparison between the sisters may have been based on a single physical attribute (which may have even been observed directly by others), Ann's comparative relations have allowed her to contrast this physical superiority and her co-ordination relations have allowed her to co-ordinate this superiority with being better *generally*. Of course, the latter would also quickly have become co-ordinated with Ann feeling bad about herself. So, it is easy to see how even simple relations and the fact that they involve feelings can lead us early in our lives towards a path of low self-esteem.

The above example also illustrates how perspective-taking behaviour becomes increasingly arbitrary and thus, at one level, moves further and further away from physical attributes. Indeed, as verbally sophisticated adults, most of our comparisons with others are *not* based on physical attributes. For example, I might be consumed by jealousy because, from my perspective, my neighbour appears to be richer than me and yet I have no way of knowing how much money my neighbour actually has.

In fact, who we come to know ourselves to be across time emerges on the basis of our perspective on others, such that it seems unlikely that there would be an *I* without a *YOU*. What makes perspective-taking distinct from other types of relational activity is the paradox that I vs. YOU relations become a constant reference point for our perceptions, even when many aspects of our lives are constantly changing. For example, if I suddenly learn that my 'rich' neighbour has lost his job, I may now believe that we are equal in wealth, but we are still different people. That is, aspects of who you are may change constantly, but your

perspective from which these changes are observed does not. In short, you always see the world from your own perspective.

HERE versus THERE. There is a long literature on the importance of a sense of place in human development and for RFT this is captured by the spatial relations of HERE and THERE. In conjunction with development in I vs. YOU relations, we learn to distinguish between HERE (not THERE) and THERE (not HERE). For example, when daddy comes home, a child might say "I am watching TV (HERE), but mummy is in the kitchen (THERE)". Similar to I-YOU relations, spatial relations become increasingly less based on physical locations and become increasingly arbitrary. For instance, if I say "I am here" at this moment in time, I am in my office, but if I say "I am here" one hour from now, I will be in my kitchen. In other words, the word "HERE" coordinates with where I am at that point in time, hence it is constantly changing. Paradoxically, much of the language that we use refers to physical space, but in a metaphorical way. Consider Sarah who describes her feelings of depression as "bearing down on her" or as a sense of "carrying the weight of the world on her shoulders".

It is clear from the examples above that I-YOU relations are implicit in HERE-THERE relations, because it would be impossible to specify a perspective from a particular location if there was no perspective from which to operate. As a result, Sarah is talking about *her* feelings, which are part of the way she sees herself at that time. As such, the spatial relations are a critical feature of one's perspective because I is always co-ordinated with HERE (and distinct from THERE) and YOU is always co-ordinated with THERE (and distinct from HERE).

NOW versus THEN. Temporal relations are another core feature of perspective-taking and RFT refers to these as NOW vs. THEN relations. As the name implies, temporal relations refer to time and are naturally implicit in many everyday sentences. For example,

"At two o'clock I was working but by three, I was at home". Again, we learn temporal relations using physical features, especially when we first learn to tell the time. Once that skill is acquired, these relations then become largely arbitrary because you can make reference to time without knowing what time it actually is and because temporal relations can be extended across, days, weeks, months and even years. Consider an athlete who breaks her leg and is unable to participate in competitions. She may become fixated on what she was last year and lose sight of her life in the present (e.g. last year (THEN), I was a winner, but this year (NOW) I am a loser). Again, I-YOU relations are implicit in temporal relations, because one's perspective is always from NOW and distinct to THEN. Of course, it is important to remember that even if you are referring to how you felt in the past (THEN), the temporal relation from your current perspective is always NOW.

Integrating RFT and ACT in an Understanding of Self

In Figure 2, we have provided an overview of an RFT conceptualisation of the three selves. There are a number of key points we would like to emphasise. 1. There are two constant aspects to the self – your perspective which is always located HERE-NOW *and* your psychological content, which can be located HERE-NOW or THERE-THEN, depending upon which sense of self you are operating in at any point. Hayes (1995) referred to these two aspects as the dual functions of self in terms of "functioning both as a doer and as an observer of the doing" (p.1). So, there is, in general, no flexibility or change in perspective (*observer)*, just changes in the location of content (*doer)*. 2. Switching content always occurs in a partly bi-directional manner. Specifically, you can switch bi-directionally between self as process and self as content and this happens readily, because in both your content is located HERE-NOW. Similarly, you can switch between self as process and self as context, but this will involve switching content from HERE-NOW to THERE-THEN. However, you cannot switch

between self as content and self as context because you would have to be engaging in self as process in order to do so. In this way, self as process mediates all changes in the location of your content. Each of the three selves is described below.

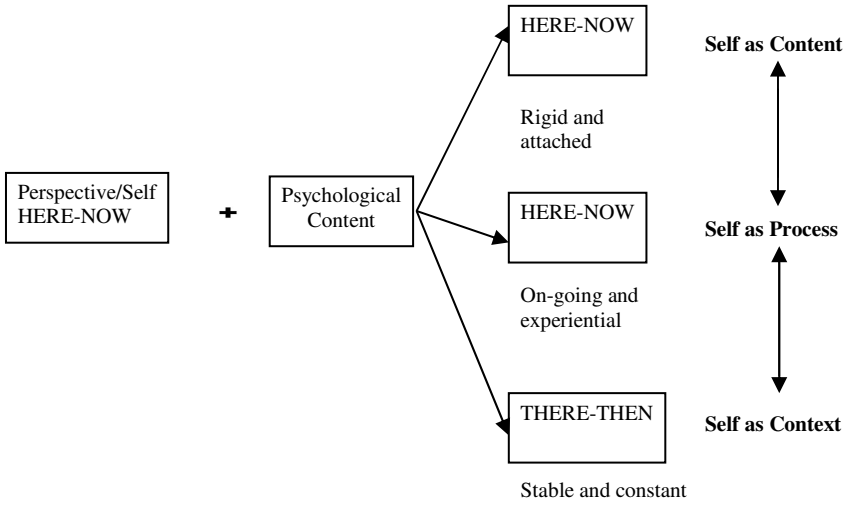


Figure 2. Conceptualisation of ACT's three selves as RFT's perspective-taking relations, as taken from Foody et al. (2012).

Self as content as deictic relations. In self as content, your psychological content (e.g. descriptions, evaluations, etc.) is co-ordinated with the self because both are located HERE-NOW (see Figure 2, top right). In other words, there are co-ordination relations between who you are and what you think. The self is always HERE-NOW, that is the place from which the whole human being observes. Your content may be HERE-NOW, but only if it is on-going and experiential (that would be self as process, see below). The instant your content is HERE-NOW and this is not on-going and experiential, then the content is rigid and conceptualised. As a result, these functions of the content transform to the co-ordinated self and this in turn becomes rigid and conceptualised (i.e. you are attached to it). This level of cognitive fusion makes it very likely that your content will exert some control over behaviour, especially because the self is in relational networks with many other types of content and so

on. The only alternative is to keep your content on-going and experiential (i.e. to stay in self as process).

In our developmental histories, we are trained from a young age to adopt our perspectives from HERE-NOW in terms of discriminating and evaluating everything that we do. This is likely the way in which our perspective-taking skills develop and for the most part early on, that is a good thing. So, even for verbally sophisticated individuals, there will always be a certain amount of content that is co-ordinated with HERE-NOW, in a manner that is consistent with your history.

The more verbally sophisticated we become the more solid the self becomes and the more fluent we should be in operating in self as process (or even self as context) with regard to our psychological content. Ideally, there should be only a minimal amount of content that is rigid and conceptualised because your detailed experience and constancy of the self should indicate that content is only content and not who you are. However, given that our developmental histories are full of discriminating and evaluating everything that we do, we would need special training in order to continue to operate in self as process. Indeed, we would also need special training to transform the co-ordination relations between content and self as HERE-NOW to a relation of distinction or hierarchy in which self is HERE-NOW but our content is THERE-THEN (self as context).

Self as process as deictic relations. Now let us consider how RFT can account for what is happening at a relational level in self as process (see Figure 2, centre right). There is no *relational* difference between self as content and self as process, although they are significantly different experientially. In both selves, the doer is located HERE-NOW and, as always, the observer is HERE-NOW also. In self as process, there is a sense of the movement of psychological content from HERE-NOW to THERE-THEN. This means that although psychological content is problematic in self as content because it is HERE-NOW, self as

process is different in that your content as HERE-NOW is simply the way we learn to talk about our thoughts, feelings and behaviour and thus facilitates self-knowledge rather than fusion.

Self as context as deictic relations. Unlike both self as content and self as process, your content, when in self as context, is THERE-THEN (see Figure 2, bottom right). In other words, in self as context all that is left in HERE-NOW is I. Just as our developmental histories require (for communicative and social reasons) that our content is HERE-NOW in terms of both self as content and self as process, it is equally important that our histories establish the skills required to switch psychological content from HERE-NOW to THERE-THEN as in self as context.

Psychological Flexibility: Switching Between Selves

According to the ACT-RFT integrated model of self proposed by Foody et al. (2012) and illustrated above, one does not change one's perspective *(observer),* but simply changes the location of content *(doer).* It is important, therefore, to clarify the nature of these changes with regards to one's content. Specifically, switching content always occurs in a partly bi-directional manner. That is, you can switch bi-directionally between self as process and self as content and this happens readily because in both your content is located HERE-NOW. Similarly, you can switch between self as process and self as context, but this will involve switching content from HERE-NOW to THERE-THEN. However, you cannot switch between self as content and self as context because you would have to be engaging in self as process in order to do so. In this way, self as process mediates all changes in the location of your content.

The primary goal of ACT is to increase psychological flexibility, particularly with regard to the self. Specifically, this would involve being able to switch readily between self

as process and self as context. However, because your psychological content in self as process remains HERE-NOW, you can very easily become attached to aspects of this content and thus find yourself quickly back in self as content. What this means for ACT is that clients should learn to switch readily from self as content to self as process in order to minimise fusion. In short, when operating in self as process you can easily get sucked into self as content and when operating in self as content you need to switch quickly to self as process.

Figure 2 also highlights the importance of switching flexibly between self as process and self as context. It seems unlikely that you could operate to a great extent in self as context because you would quickly find yourself operating in self as process (because new experiences are happening all the time). Hence, these on-going experiences would quickly draw you from self as context to self as process. In the other direction, there will be occasions in which the risk of slipping from self as process to self as content is great and in this situation (involving what we can think of as *sticky* content) it would be beneficial to switch from self as process to self as context. In this way, self as context is the safest place to operate with regard to your content and is essential in dealing with content with which you have a history of being fused. But, it is highly improbable that you will stay long in self as context and will thus return quickly to self as process.

Implications for the relationship between transcendence and self as context. It seems plausible that highly competent meditative practices may allow you to access a place that *feels* non-verbal and it is thus tempting to consider that self as context is non-verbal, hence essentially non-relational. Barnes-Holmes, Hayes and Gregg (2001) have summarised this issue across the following two excerpts:

> spirituality is an experience of "transcendence" or "oneness" that comes when literal, analytic and evaluative functions of relational framing are massively reduced and the relational functions of I, HERE and NOW are thereby allowed to predominate" (p.243).
>
> a sense of transcendence results, in large part, from a situation in which the evaluative functions attached to HERE and NOW repeatedly transfer to THERE and THEN in these two relational frames. More specifically, when an evaluation (located I, HERE and NOW)

> is discriminated as just an evaluation, it immediately acquires the relational functions of I, THERE and THEN. If this form of shifting within the frames keeps repeating itself, a person's "normal" perception of reality may be undermined, leading to a sense of transcendence. From an RFT perspective this is exactly what happens during some forms of meditation. For example, dispassionate observation of spontaneous thoughts and feelings is encouraged in Buddhist forms of meditation and with sufficient practice, feelings of tranquillity and transcendence often emerge (see Hayes, 1984). For RFT, the "experience" of transcendence occurs because each evaluative function that occurs during meditation immediately loses most of its psychological functions when it shifts from I, HERE and NOW to I, THERE and THEN" (p.244).

According to this view, the on-going defusion that comes with self as context, in terms of the massive reductions in the transformations of evaluative and other functions through the relations of HERE-NOW, would indeed feel like transcendence. However, this behaviour is ultimately verbal because it continues to require that you observe from the perspective of I-HERE-NOW. It is important to emphasise, therefore, that self as context is unique in terms of the content being located THERE-THEN and this, in turn, provides a more stable perspective of I-HERE-NOW.

The transcendent experience has another quality that is unique. This is best illustrated through examples. Imagine a musician working on a score or an artist working on a canvas. In both cases, these individuals are highly absorbed in a single focus. But this focus is always *in addition to* the observer. The focus feels almost entirely automatic in the sense that it is highly practiced, and competent individuals have learned to focus on only that endeavour and nothing else. After many years of practice, this focus would become highly automatic. However, the individual is always observing at the same time. In short, there is always the observer and the doer and they always remain distinct.

Now consider a Vipassana meditation master. What this individual is focusing intensely on is herself (not a canvas or a score, just herself). This is an extremely rare situation in which she is focusing solely and entirely on herself and nothing else. In addition, across many years of training, she learns to do this with high automaticity, so that she can quickly reach a place of almost no content for extended periods of time. In this context, it

would feel like the observer and the doer had collapsed into one because there is little doing (i.e. no transformations of stimulus functions either HERE-NOW or THERE-THEN) and all observing. In short, there is nothing HERE-NOW, but *I* on an on-going basis. However, this very fact would suggest that even this type of behaviour is verbal because you are still operating from the perspective-taking frames.

Although possible, accessing such a place would require vast practice and would only last a considerable length of time if you had developed high levels of automaticity in this regard in order for the transformations of stimulus functions to remain at such a low level. Hence, the two great challenges to a highly verbal organism attempting to reach such a height are: 1. Getting there and 2. Staying there. This would present enormous challenges for anyone, let alone an individual who has a history of fusion and experiential avoidance.

The Issue of Middle Level Terms

The current ACT hexaflex incorporates self as context as one of the six essential and interrelated processes, and self as context holds a central place at the heart of the model. However, the hexaflex is a heuristic model of processes which to date have not been subject to functional analyses and this weakness applies to self as context, as much as to the remaining five suggested processes. If one was to start with a bottom-up analysis, there would be no hexaflex because such a model is top-down. If one starts with a top-down model, then the aim becomes about searching for functional analytic terms which might map onto those already present within the model. But this may be neither possible nor useful. For example, if existing processes turn out not to be functionally identifiable, then they would have to be abandoned. That is difficult to do once a model gets established in a verbal community, especially when this occurred in the absence of functional evidence. So, in a sense integrating RFT concepts into a top-down heuristic model (especially point-by-point

mapping) is the mixing of two types of analyses. However, if the hexaflex model is widely adhered to and understood by a specific verbal community, then perhaps the integration presented in this thesis is a good place to start.

There are obvious merits to reticulated models and indeed it is hard to see how to integrate clinical and basic research concepts in any other way without essentially becoming solely either top-down or bottom-up. Psychological traditions, on the whole, have not been particularly successful in this regard; hence it is hard to look for comparisons elsewhere. But, it is also difficult to see in advance what this reticulation of concepts will ultimately look like. For example, if ACT-based concepts eventually yield to RFT interpretations (e.g. self as context may be operationally defined in terms of a combination of deictic and hierarchical frames), this would in practice be bottom-up. It is certainly the case that the reticulated approach is appropriate for integrating ACT and RFT *at the present time* when the two pillars rely on distinctly different concepts. However, it may be the case eventually that middle level clinical concepts are no longer valuable and that clinicians will be trained to use bottom-up concepts from the beginning. In such a scientific ideal, a reticulated model would no longer be necessary.

Although there is sound outcome data to suggest that ACT, when comprising self-based techniques, is effective in achieving its therapeutic aims (Hayes et al., 2006; Levin, Hildebrandt, Lillis & Hayes, 2012), two clear gaps are present in the relevant literature. First, there is little or no published evidence demonstrating that these techniques are active ingredients in these outcomes. Second, the concept of the three selves is a middle level term and thus does not yield readily to functional analysis. Given that self is argued to play such a pivotal role in ACT, this is something of a weak scientific position for that therapeutic paradigm. The research in the current thesis was specifically designed to address this issue.

The Current Research

The current programme of research had four main aims. First, we hoped to extend existing work on experimentally induced distress, with a particular focus on finding an appropriate preparation that would lend itself to the exploration of brief therapeutic interventions with non-clinical samples. On this path, we returned to one of the earliest and simplest methodologies in the literature – the single-sentence preparation. Second, we investigated the impact of techniques referred to as self as context in terms of ameliorating distress induced by the single-sentence preparation. Third, we compared mindfulness and self as context techniques, and subsequently investigated individual components of mindfulness. Finally, we explored the potential role of concepts derived from relational frame theory (RFT) in enhancing self as context techniques.

Experiment 1 systematically compared the single-sentence to a multi-sentence distress induction procedure. We predicted that the multi-sentence preparation would generate greater distress. However, the results demonstrated that the preparations were equally effective in inducing emotional distress.

The single-sentence distress induction procedure was employed again in Experiments 2-5. These studies also incorporated a number of brief analogue interventions derived from acceptance and commitment therapy (ACT). Put simply, would ACT interventions that targeted acceptance, defusion, values and contact with the present moment successfully ameliorate experimentally induced distress? We also investigated whether each of these individual components would be enhanced by a self as context technique. We hypothesised that the combined interventions (e.g., self enhanced acceptance) would reduce distress more effectively. However, the results overall demonstrated that all interventions, either stand alone or combined with self as context, had little or no effect on levels of induced distress.

In Experiments 6-8, we employed an alternative form of distress induction. Similar to the design of the previous studies, in Experiment 6 we investigated the impact of mindfulness versus self as context techniques in reducing distress. We did not make any specific predictions about the outcomes, but were concerned with the possibility of differentiated outcomes based on the fact that self as context techniques encourage a focus on *psychological* events, (such as thoughts), while mindfulness techniques encourage a focus on *somatic* events (i.e. the body). Hence, comparing the two would perhaps allow us to determine whether it is the self-focus per se or the target of this focus that facilitates distress reduction. However, the results overall demonstrated that both interventions were equally effective in reducing distress.

In Experiment 7, we distinguished between two mindfulness-based components, *physical* mindfulness and *verbal* mindfulness, and thereafter investigated which of these would be more effective in reducing distress. Again, we refrained from making specific predictions about potentially different outcomes for the two mindfulness-based components because there are no such experimental comparisons available in the literature. The results demonstrated that both conditions significantly reduced distress.

In Experiment 8, we turned our attention to an investigation of the sequencing of mindfulness exercises and to the possibility that *combining* physical and verbal mindfulness would enhance effects observed with either component individually. We hypothesised that the sequence which presented physical mindfulness *followed* by verbal mindfulness would show greater reductions in distress than the reverse because this is the format employed in most mindfulness-based therapeutic packages (e.g. MBSR). The results demonstrated that this prediction was upheld and although both conditions reduced all measures of distress, the physical-verbal sequence was significantly better.

In Experiments 9 and 10, we employed the same distress induction procedure to investigate the role of distinction and hierarchical relations when targeted specifically in a self as context exercise. We hypothesised that the hierarchical self as context intervention would show superiority over the distinction self as context condition based on previous research by Luciano et al. (2011). The results were consistent with this prediction as the hierarchical intervention was the more effective in reducing distress.

Experiment 10 attempted to explore this issue further using a different ACT exercise. This study also included a practice interval placed between two exposures to the distress induction task to determine potentially lasting impacts of the interventions.

A second aspect of the research examined the extent to which a focus on the *self* played a specific role in the outcomes described above. Accordingly, Experiment 10 compared interventions that focused on participants' thoughts about the self-criticism that comprised the distress induction procedure (i.e. self-focused) versus interventions that focused on thoughts about an inanimate object (i.e. object-focused). In short, participants in both groups were asked to focus on thoughts, but only in the self-focused interventions did they focus on thoughts about themselves. We hypothesised that the self-based hierarchical intervention would be the most effective in terms of distress reduction because it aimed to target both self-specific content and hierarchical relations. This prediction was somewhat supported, as both hierarchical conditions (self hierarchy and object hierarchy) showed superiority over both distinction conditions. Furthermore, both hierarchical conditions were associated with significantly less avoidance in the second distress induction. Interestingly, there were little differences between the interventions which targeted the self and those which did not. In the final chapter the thesis discusses the implications of the work for the existing literature on experimental distress induction procedures, ACT, mindfulness and RFT.

Chapter 2
Experiment 1

Experiment 1

Experimental Comparison of Two Distress Induction Procedures

Clinical researchers have employed an array of experimental procedures for the investigation of various aspects of mental suffering, in the hope of improving our understanding and treatment of mental health issues (e.g. Hayes, Bisset et al., 1999; Wegner, Schneider, Carter, & White, 1987). These include: the CO_2 challenge (e.g. Levitt, Brown, Orsillo, & Barlow, 2004); the cold-pressor task (e.g. Keogh, Bond, Hanmer, & Tilston, 2005); brief electric shock (e.g. McMullen et al., 2008); and radiant heat induction (e.g. Kehoe et al., in press). Although many studies of experimental distress induction involve specific clinical populations, an even greater number have been used with non-clinical samples. For example, one of the shortest forms of distress induction used with these samples was developed by Rachman et al. (1996). In the single-sentence procedure, participants are asked to insert the name of a close relative or friend into the sentence "I hope *[name]* is in a car accident" and then say the sentence aloud, while trying to visualise the hypothetical scene. Rachman et al's results demonstrated that the single-sentence manipulation increased anxiety, guilt and feelings of moral wrongness, as measured on visual analogue scales (VASs).

Several recent studies have incorporated brief and therapeutic interventions into distress induction procedures to determine if the former can reduce the distress associated with the later. For example, Kehoe et al. (in press) investigated the effects of brief acceptance- and, distraction-based interventions on tolerance of experimentally induced radiant heat pain in a non-clinical sample of undergraduates. Levitt et al. (2004) also investigated the effects of acceptance and suppression on distress with a clinical sample of individuals with panic disorder when exposed to the CO_2 challenge.

It is difficult to employ the same experimental procedures with both clinical and non-clinical samples, especially when therapeutic components are also tested. For example, if the typical participant in a psychology experiment is provided with an acceptance-based intervention for a randomly generated piece of psychological content (e.g. a self-criticism), the outcomes might look very different than if the same situation was presented to a participant specifically selected for the presentation of a particular type of psychological suffering. However, if the procedures that underpin distress and, as well as those behind its alleviation, are to be investigated, an essential starting point is experimental work with non-clinical samples. Hence, it is important to find a distress induction procedure that is effective in non-clinical individuals and which lends itself to distress reduction by brief analogue interventions.

On the path towards selecting a method of experimental distress induction that would potentially lend itself to the exploration of different therapeutic interventions with non-clinical samples, we returned to one of the earliest and simplest methodologies in the literature -- Rachman et al.'s (1996) single-sentence procedure. Although extremely simple in form, numerous studies have demonstrated the utility of this preparation in inducing experimental emotional distress with both clinical and non-clinical samples (e.g. Bocci & Gordon, 2007; Marcks & Woods, 2007; van den Hout, Kindt, Weiland, & Peters, 2002; Zucker, Crask, Barrios, & Holgium, 2002). However, there appear to be no published studies that have attempted any systematic comparisons between this and other procedures. For example, ACT clinicians often employ a very similar preparation in the service of facilitating defusion. In this procedure, clients are asked to write a short paragraph dictated by the therapist describing a hypothetical road crash involving a client's loved one. The paragraph usually contains around five written sentences which the therapist uses to explore how much literal belief the client has in the written content and how the content potentially changes

during the translation from thought to written word. This procedure is well known for inducing considerable distress for clients, especially when literality of thoughts is high. Of course, this short defusion exercise bears considerable similarity with Rachman et al.'s procedure, but involves *five* target sentences rather than *one*. As a result, one might suggest that the distress outcomes recorded with Rachman et al.'s procedure might be enhanced by including more sentences, similar to the defusion exercise. Experiment 1 was designed to explore this methodological issue.

In short, we systematically compared a single-sentence to a multi-sentence distress induction procedure to determine if the latter might generate greater emotional distress. Consistent with this simple aim, the current hypothesis predicted that the multi-sentence procedure would be associated with larger increases in measures of subjective distress than the single-sentence procedure. This hypothesis was based on the view that a longer manipulation would likely generate more vividness of the scene and thus increase participants' negative appraisal of the hypothetical accident.

Method

Participants

Ninety volunteers (43 male and 47 female) participated in Experiment 1. All were aged between 18 and 23 years old, were undergraduates from the National University of Ireland Maynooth (NUIM) and held current driving licences. A number of exclusion criteria resulted in 26 participants not completing the experiment. Specifically, 11 individuals who reported that they had recently lost a loved one in an accident were excluded from participation because the experiment involved asking participants to imagine such an event. In addition, 15 individuals were excluded on the basis of reporting significant mental health issues (e.g. anxiety) that may be adversely affected by participation. This yielded a final

sample of 64 participants (29 males and 35 females, mean age = 19 years and 9 months), who were assigned randomly across two experimental conditions: single-sentence distress induction (N = 32) and multi-sentence distress induction (N =32).

Setting and Materials

All aspects of the study were conducted in the Experimental Room in the Department of Psychology at NUIM. The Experimental Room and an adjoining Observation Room were connected via a one-way mirror that permitted the Experimenter in the Observation Room to observe participants in the Experimental Room, but not vice versa. Both rooms were kept free from noise and disruption as much as possible.

The Experimental Room contained: a desk; two chairs; a pen; a sheet of blank paper; a Consent Form (see Appendix 1); an Experimental Screening Questionnaire (ESQ, see Appendix 2); the Acceptance and Action Questionnaire-II (AAQ, see Appendix 3); the Philadelphia Mindfulness Scale (PHLMS, see Appendix 4); three identical copies of Visual Analogue Scales (VASs, see Appendix 5); two copies of a Reaction Questionnaire (RQ, see Appendix 6) and a Debriefing Form (see Appendix 7).

The ESQ was designed for exclusion purposes in the current experiment. It contained six simple questions that primarily determined whether participants had a current driving licence, had ever lost a relative in a car accident, or had suffered from any mental health issues that may be adversely affected by participation. Participants responded by selecting YES or NO to one or more of five listed categories (e.g. anxiety disorder) and three specific questions (e.g. “Have you ever been affected by a car accident?”). Any item ticked with YES resulted in immediate exclusion from the experiment.

The two self-report measures, namely the AAQ and the PHLMS, assessed participant levels of avoidance and mindfulness, respectively. As well as determining the potential role

of these factors in experimental outcomes, it was useful to balance scores on these measures across experimental conditions.

The AAQ is a standard self-report measure of experiential avoidance (Bond et al., 2011). There are seven items (e.g. "I'm afraid of my feelings"), to which participants respond by circling a number from 1 (Never True) to 7 (Always True). The responses on each item are summed to generate a total score for avoidance (minimum = 7, maximum = 49). The mean for a non-clinical sample is low in avoidance and has been reported at 17.34 (*SD* = 4.37), with a mean alpha coefficient of .84 (.78 - .88) and 12-month test-retest reliability of .79 (Bond et al.).

The PHLMS is a standard self-report measure of mindfulness capabilities (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008). This 20-item measure contains 10 items that assess mindful awareness (e.g. "I am aware of what thoughts are passing through my mind") and 10 that assess mindful acceptance (e.g. "There are aspects of myself I don't want to think about"). Participants respond by circling a number from 1 (Never) to 5 (Very Often) on each item. The responses are summed to generate a separate overall score for each sub-scale (minimum = 20, maximum = 100). The mean for a non-clinical sample has been reported at 36.65 (*SD* = 4.93) and 30.19 (*SD* = 5.84) on the awareness and acceptance sub-scales, respectively. Internal consistency reliability analyses have yielded a Cronbach's alpha level of 0.75 for awareness and 0.82 for acceptance (Cardaciotto et al.).

Three VASs served as the dependent measures and assessed participants' self-reported levels of discomfort, anxiety and stress. Each VAS comprised of a 16cm line, on which participants placed an X from 0% (e.g. No Discomfort) to 100% (e.g. Very Much Discomfort).

The RQ was designed for current purposes. This short self-report measure consisted of five questions about willingness, vividness, believability, guilt and moral wrongness (e.g.

"Please rate how much guilt you feel after saying and writing the sentence") regarding the distress induction procedure. Participants responded to each question by placing an X on a corresponding VAS from 0% (e.g. No Guilt) to 100% (e.g. Very Much Guilt).

Ethical Issues

This experiment adhered strictly to current guidelines of the British Psychological Society (BPS, 2010) and the Psychological Society of Ireland (PSI, 2003). Ethical approval was obtained from the Researcher's supervisor and the National University of Ireland, Maynooth. It is important to emphasise a number of key features in this regard, which were also highlighted in the consent form. 1. Each participant was briefed as to the nature of the study prior to agreement to participant. 2. Participants were advised that none of the materials were being used for clinical purposes and in particular, that the intervention was not designed to function as a type of treatment. 3. Participants received advance notification that the experimental manipulation involved a distress induction procedure that may cause brief periods of distress throughout the experiment. 4. Participants with a self-reported history of psychological distress, which could have been influenced by experimental distress induction, did not participate in the experiment. The researcher and the participants were the only parties that had access to this information (which was provided by the participant on the ESQ). In addition, the Researcher was responsible for encoding the data so that it provided no identifying information 5. Participants could terminate their involvement at any time and remove any, or all, aspects of their data. It was stressed prior to the experiment that even though they would not be reminded, it was completely acceptable to stop at any point. 6. All data would be retained for a period of three years after which it was destroyed by the Experimenter. 7. Each participant could view her/his data at any time, but not the data of others. 8. All aspects of participation were confidential and the data was encoded by the

Researcher so that it, or its representation offered no identifying information. 9. In the unlikely event of distress of any form resulting from participation and lasting thereafter, participants were advised that they could gain access to a chartered psychologist and therapist free of charge to discuss these issues. 10. All participants were fully debriefed before leaving the Experimental Room. No participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of four stages (Stages 1-4), always conducted in the same order. These stages are presented in Figure 3.

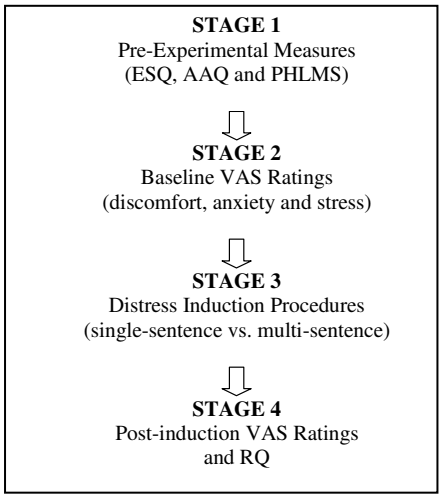


Figure 3. An overview of the experimental sequence in Experiment 1.

Stage 1: Pre-experimental measures. Prior to commencement, participants completed a Consent Form, the ESQ, PHLMS and AAQ (see pages 51 and 52 for descriptions). During a short break immediately thereafter, the ESQ was assessed for

exclusion purposes. Where exclusion applied, participants were thanked and debriefed. All others proceeded immediately to the next stage.

Stage 2: Baseline VAS ratings. During Stage 2, participants completed the three baseline VAS ratings of discomfort, anxiety and stress.

Stage 3: Distress induction procedure (single-sentence vs. multi-sentence conditions). The distress induction procedure that comprised the single-sentence condition was taken from previous research by Rachman et al. (1996). The multi-sentence task was developed for current purposes but was derived from defusion-based exercises commonly used in ACT (Hayes et al., 1999). Prior to each distress induction, all participants wrote down the name of the person they cared about most in the world.

Single-sentence condition. The single-sentence condition primarily involved participants saying aloud and writing a potentially distressing sentence about the involvement of the loved one named above in an accident. The instructions were as follows:

> Ok, so when you're ready we will begin. What is going to happen is that I am going to call out a sentence that I want you to repeat word for word. Once I read out the sentence, if you can, I want you to take a moment to imagine the scene it describes and then say the sentence with as much meaning as you can. Once you have said the sentence aloud, I want you to then write it down on the page in front of you. Now remember, if you don't want to say the sentence or you want to stop writing it at any stage, you are completely free to do so. Just let me know and we will stop what we are doing and move onto the next part of the experiment. Is that ok with you? Do you have any questions at this point?
>
> (*Participant affirms*)
>
> Ok let's begin. Here is the sentence: "I hope *(name of loved one*) dies in a car accident."
>
> (*Participant repeats and writes*)

Multi-sentence condition. The difference between the two conditions centred on the use of a more extended hypothetical accident story in the multi-sentence condition in an attempt to increase the vividness and impact of the exercise. Specifically, participants were asked to repeat and write *five* sentences regarding the accident. To make the story more feasible, participants in this condition were initially asked additional questions about the

loved one (e.g. “What is she/he doing today?” and “What time will she/he be finished work?”). This elaboration ensured that the scenario was relevant and unique to each individual. Participants in the multi-sentence condition were instructed along following lines:

> Ok, so when you’re ready we will begin. What is going to happen is that I am going to call out five sentences and I will stop after each one. Once I read out each sentence, if you can, I want you to take a moment to imagine the scene it describes and then say the sentence with as much meaning as you can. Once you have said the sentence aloud, I want you to then write it down on the page in front of you. When you have done this, we will move onto the next sentence; I will say it and you will repeat it and write it down. Now remember, if you don’t want to say any of the sentences or if you want to stop writing at any stage, you are completely free to do so. Just let me know and we will stop what we are doing and move onto the next part of the experiment. Is that ok with you? Do you have any questions at this point?
>
> (*Participant affirms*).
>
> Ok let’s begin. Here is the first sentence:
>
> Today at X o’ clock (*as appropriate*), X (*name of loved one*) is waiting for me to collect him/her.
>
> (*Participant repeats and writes*).
>
> She/he does not know that I am feeling very sleepy at the wheel of my car.
>
> (*Participant repeats and writes).*
>
> Just as I pull up, my eyes close and I lose control of the car.
>
> (*Participant repeats and writes).*
>
> My car speeds onto X’s (*name of loved one’s*) side of the road and I hit him/her head on.
>
> (*Participant repeats and writes).*
>
> I hope X (*name of loved one*) dies in the car accident.
>
> (*Participant repeats and writes).*

Stage 4: Post-induction VAS ratings and RQ. The post-induction VAS ratings were identical to Stage 2, but were included at this stage to assess discomfort, anxiety and stress *after* the distress induction procedure. In addition, Stage 4 involved presentation of the RQ to assess participant reactions to saying and writing the sentence(s) about the hypothetical accident. This marked the end of the experiment and participants were thanked and debriefed.

Results

Two main investigations were central to Experiment 1. The first examined the effect of the distress inductions (single- or multi-sentence) on mean scores of discomfort, anxiety and stress. The second investigated the hypothesis that the multi-sentence condition would be associated with larger increases in measures of distress induction than the single-sentence condition.

Pre-Experimental Measures

The pre-experimental outcomes for avoidance and mindfulness are presented in Table 1. The AAQ means were low for both conditions and ranged from 16-18, thus both were within the normal range (i.e. <18). The mean PHLMS scores for the acceptance sub-scale were also low (28 and 29) and again within the normal range (<31). Outcomes on the awareness sub-scale (33 and 34) were also low and within the normal range (<37). Three independent samples t-tests confirmed that the two conditions did not differ significantly on either measure (all p's > .65).

Table 1
Means, Standard Deviations and Significance Values by Condition on the Pre-Experimental Measures in Experiment 1

Pre-experimental Measures	**Single-Sentence** ***M* (*SD*)**	**Multi-Sentence** ***M* (*SD*)**	***p* values**
AAQ	16 (5.10)	18 (6.20)	.65
PHLMS (acceptance)	29 (4.60)	28 (8.00)	.90
PHLMS (awareness)	33 (5.50)	34 (7.40)	.83

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

Both the single- and multi-sentence conditions increased participants' self-reported levels of discomfort, anxiety and stress. The mean VAS ratings by condition recorded on each scale at pre- and post-induction are presented below.

Discomfort. The VAS ratings of discomfort at baseline were extremely low (i.e. all participants scored <11/100). This pattern changed for both conditions at post-induction (see Figure 4). A mixed between within 3x2 ANOVA revealed a statistically significant main effect for time [Wilks' Lambda = .45, F (1, 62) = 74.60, p = .00, partial eta squared = .55] that accounted for a substantial amount of the variance (55%), however, there was no significant effect shown for condition [F (1, 62) = .73, p = .4, partial eta squared = .01]. The interaction effect was also non-significant [Wilks' Lambda = 1.0, F (1, 62) = .04, p = .84, partial eta squared = .00].

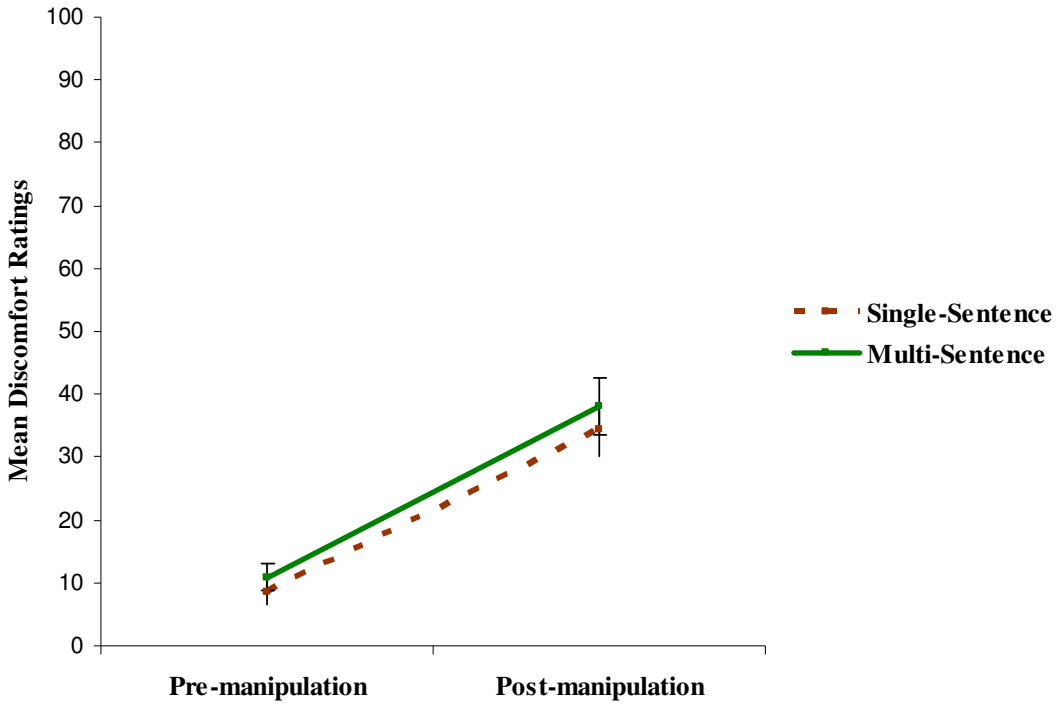


Figure 4. Mean discomfort ratings per condition across time in Experiment 1.

Anxiety. The VAS ratings of anxiety were also extremely low at baseline (all <11/100). Anxiety increased similarly after both types of induction (see Figure 5). A 2x2 ANOVA again revealed a highly significant main effect for time [Wilks' Lambda = .58, F (1, 62) = 44.14, p = .001, partial eta squared = .42] that accounted for a substantial amount of the variance (42%) but the effect for condition [F (1, 62) = .17, p = .68, partial eta squared = .00] was not significant. The interaction effect was also non-significant [Wilks' Lambda = 1.0, F (1, 62) = .08, p = .77, partial eta squared = .00)].

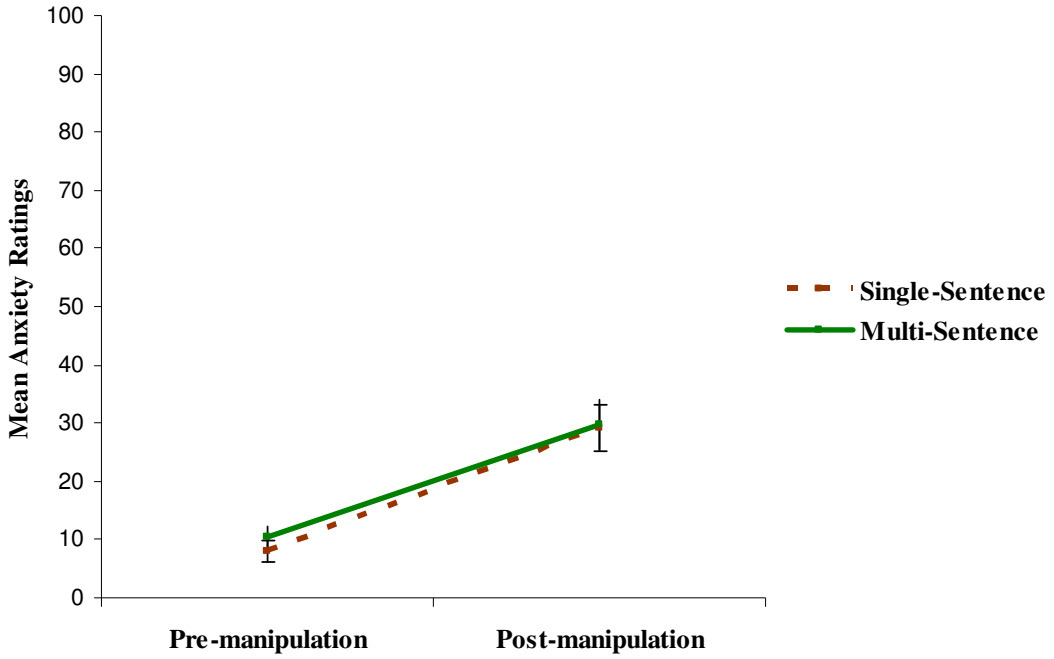


Figure 5. Mean anxiety ratings per condition across time in Experiment 1.

Stress. The VAS ratings of stress were again extremely low at baseline (all <9/100) and increased similarly after both types of induction (see Figure 6). A 2x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .65, F (1, 62) = 33.40, p = .01, partial eta squared = .35] that accounted for a substantial amount of the variance (35%), but the effect for condition was not significant [F (1, 62) = .012, p = 9.15, partial eta squared

= .00]. The interaction effect was again non-significant [Wilks' Lambda = 1.00, F (1, 62) = .1, p = .75, partial eta squared = .00].

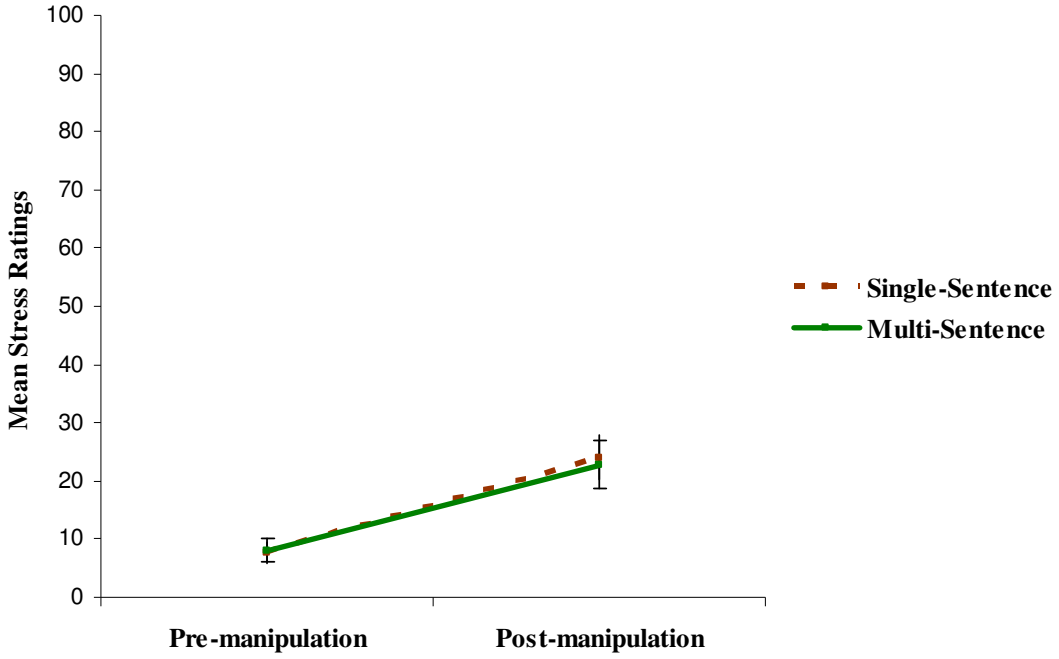


Figure 6. Mean stress ratings per condition across time in Experiment 1.

RQ Results

The mean ratings on each of the five reactions to the distress inductions are presented separately below. Table 2 presents the data from each of the five reactions by condition.

Table 2
Means, Standard Deviations and Significance Values by Condition for the RQ in Experiment 1

Reactions Questionnaire	Single-Sentence *M* (*SD*)	Multi-Sentence *M* (*SD*)	*p* values
Please rate your level of **willingness** to engage with your thoughts of the accident	27.06 (26.00)	53.79 (26.53)	.01
Please rate how **vivid** your thoughts and images were of the car accident	30.16 (28.35)	52.19 (26.09)	.00
Please rate how **believable** the accident scenario was to you	25.03 (25.40)	36.37 (27.15)	.09
Please rate how much **guilt** you feel right now	51.45 (33.19)	41.45 (32.73)	.23
Please rate how **morally wrong** you felt it was to write or say the sentence (s)	59.59 (35.33)	48.03 (33.9)	.19

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Willingness. Participant ratings of their willingness to engage with thoughts about the accident scenario were low to moderate (see Table 2), although the multi-sentence ratings were almost twice as high as the single-sentence ratings (53.79 compared with 27.06). An independent samples t-test indicated that this difference was significant [t (32) = -2.97, p = .01].

Vividness. Ratings of the vividness of thoughts and images of the accident were also low to moderate (see Table 2), but again, multi-sentence ratings were much higher than single-sentence (52.19 vs. 30.16). An independent samples t-test indicated that this difference was also highly significant [t (62) = -3.23, p = .00].

Believability. Believability ratings of the accident were moderate for both conditions (see Table 2), but marginally higher again for multi-sentence (36.37 vs. 25.03). An independent samples t-test indicated that this difference was not significant [t (62) = -1.73, p = .09].

Guilt. Ratings of guilt generated by the accident scenario were moderate (see Table 2), although multi-sentence on this occasion was lower (41.45) than single-sentence (51.45). However, an independent samples t-test indicated that this difference was not significant [t (62) = 1.21, p = .23].

Moral wrongness. Ratings of how morally wrong it was to imagine the accident scenario were moderate (see Table 2), with multi-sentence again lower (48.03) than single-sentence (59.59). But again, an independent samples t-test indicated that this difference was not significant [t (61) = 1.33, p = .19].

Results Summary

The data from the pre-experimental measures indicated that participants in both conditions showed normal range scores and did not differ significantly from each other on their propensities towards avoidance or mindfulness. At baseline, mean ratings of discomfort, anxiety and stress were very low for both conditions, but both groups of participants showed significant increases in all three ratings at post-induction. Hence, although both types of induction did cause distress, the research prediction that the multi-sentence condition would be associated with greater increases in the dependent variables was not confirmed. Interestingly, however, results from the RQ indicated some differences between conditions. That is, in the multi-sentence condition participants showed significantly higher willingness to engage with their thoughts about the accident and significantly higher vividness of these thoughts than the single-sentence condition. In addition, believability was also almost significantly higher for the multi-sentence condition. Guilt and moral wrongness were higher for the single-sentence condition, although this difference was not significant.

Discussion

On the path towards finding a method of experimental distress induction that would potentially lend itself to the exploration of the relative impact of different therapeutic interventions, we returned to one of the earliest and simplest methodologies in the literature -- Rachman et al.'s (1996) single-sentence procedure. Although widely used and with considerable reported success, no published studies show any systematic comparisons between this and other procedures. Experiment 1 adapted a short defusion-based intervention from ACT that bore strong similarity with Rachman et al.'s procedure, but which was longer in length. Hence, the simple methodological question addressed by Experiment 1 was whether Rachman et al.'s procedure might be enhanced by increasing the number of sentences similar to the defusion exercise. Although the experimental hypothesis of superiority for the longer induction procedure was not borne out, both procedures did appear to provide significantly increased distress on all three subjective dependent variables.

Chapter 3
Experiments 2-5

Experiments 2-5

Empirical Investigations of the Role of Self in ACT Techniques

Acceptance and Commitment Therapy is distinct from other behavioural therapies because of its underlying heuristic model (referred to as the 'hexaflex') which articulates middle level processes (see Figure 1 in the General Introduction, see also Hayes et al., 2006). The role of self is explicit in the hexaflex and is captured by the term 'self as context', although (rather confusingly) the same term is also used to describe therapeutic exercises that address this component. Although designated as an individual component process, self as context is deemed to be a core or pivotal feature of ACT because it encompasses all other ACT processes. For example, self as context is argued to encompass acceptance, defusion, values and contact with the present moment, because all five processes are necessary for the construction of a secure sense of self that is distinct from one's psychological content (Fletcher & Hayes, 2005).

The series of studies reported in the current chapter focused on empirical analyses of typical ACT interventions in the context of an experimental distress induction procedure. If, as suggested by the hexaflex, self as context is pivotal to other ACT processes, we reasoned that potential distress reduction outcomes associated with ACT interventions would likely be enhanced by the addition of a self as context component. In simple terms, we asked if ACT interventions targeting acceptance, defusion, values and contact with the present moment would successfully reduce experimentally induced distress and if so, could these effects be enhanced by adding a self as context intervention? The aim was to specifically investigate these four processes with the same experimental design. Given that the results from Experiment 1 showed no superiority of the longer five-sentence distress induction procedure

over Rachman's single-sentence paradigm, we chose the latter shorter methodology as our focus in Experiments 2-5.

Experiment 2

Enhancing Acceptance with Self as Context

The aim of Experiment 2 was to investigate the relative utility of an acceptance-based intervention vs. a *self-enhanced* acceptance intervention in reducing experimentally induced distress, using the single-sentence distress induction procedure. Specifically, the research hypothesis predicted that an acceptance intervention enhanced with self as context would show greater effects in the reduction of subjective levels of discomfort, anxiety and stress than an acceptance intervention alone.

Method

Participants

Thirty volunteers (17 males and 13 females) participated in Experiment 2. All were aged between 18 and 24 years old, were undergraduates at NUIM and were able to drive. The same exclusion criteria as Experiment 1 applied (6 participants in total were excluded on this basis). This yielded a final sample of 24 participants (17 males and 7 female, mean age = 20 years, 5 months) assigned randomly across two experimental conditions: acceptance (N = 12) and self-enhanced acceptance (N =12).

Setting and Materials

All aspects of the setting and materials were identical to Experiment 1, with the exception of an extra question regarding distraction added to the original RQ. This referred to participants' reactions to the distress induction procedure (i.e. "Please rate how much you tried to distract from the sentence"). This question was included so that we could determine

whether distraction played any role in changes in distress in addition to, or separate from, the interventions themselves. Participants responded in a similar manner to the other questions on the RQ by placing an X on a corresponding VAS from 0% (No Distraction) to 100% (Very Much Distraction).

Ethical Issues

All ethical issues pertaining to Experiment 1 applied to the current study and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages (see Figure 7). Stages 1 to 4 were identical to Experiment 1 and involved: pre-experimental measures (Stage 1); baseline VAS ratings (Stage 2); the distress induction procedure (Stage 3); and post-induction VAS ratings and the RQ (Stage 4). What differentiated Experiment 2 from the previous study was the addition of three new stages (5-7) involving: one of two ACT interventions (Stage 5); a post-intervention distress induction procedure (Stage 6); and post-intervention VAS ratings and the RQ (Stage 7).

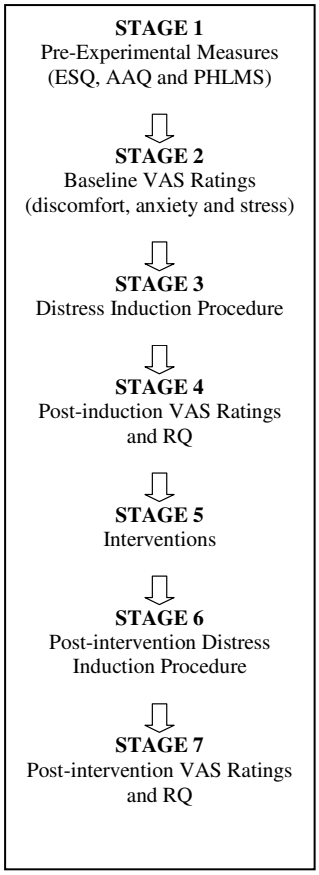


Figure 7. An overview of the experimental sequence of Experiments 2-5.

Stage 5: Interventions. Participants in the acceptance condition received two identical and consecutive exposures to a common ACT exercise designed to promote acceptance. Participants in the self-enhanced acceptance condition received one exposure to the same acceptance exercise followed by a technique designed to promote self as context. As such, the acceptance participants received two exposures to an identical acceptance intervention. Alternatively, the self-enhanced acceptance condition comprised of one exposure to an acceptance intervention followed by a different intervention which targeted self as context.

Acceptance intervention. Participants in the acceptance condition were instructed as follows (this intervention was administered twice to these participants to match for length across the two conditions):

> I understand that the previous sentence may have generated some unpleasant thoughts and feelings for you. The aim of the next part of the experiment is to teach you a coping strategy to deal with any negative thoughts or emotions that might have come up for you. Try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and listen to my voice. If you find your mind wandering, just gently come back to the sound of my voice.
>
> When very painful thoughts come to mind, they are often accompanied by unpleasant sensations. For example, your chest might tighten or you might feel tense. This package of painful thoughts and unpleasant sensations often feels like it's too much to deal with. And when we have that very thought "this is just too much", our level of discomfort goes even higher and then we feel like we are in a position where we really don't know what to do.
>
> There are many old wives tales and religious traditions that tell us that acceptance is the best medicine. What they really mean is that if you accept your thoughts and feelings they can do you no harm. Although most people know that acceptance is a good idea in principle, we all find it hard to put it into practice, especially at the times we need it most. That's probably because the thoughts and feelings that we have can seem so terribly uncomfortable and painful. So imagine at this point I asked you to consider thinking again about the thoughts and sensations that emerged for you when you were writing about your loved one. Even though you know that your actions at that time have no connection to the future, you probably began to struggle with painful thoughts like "I can't do this" "This is wrong" "What if this came true?" "I can't make my hand write this".
>
> Take a simple thought that showed up when you were writing the sentence *(Pause).* Isolate the thought in your mind *(Pause).* Now ask yourself if you would be willing to have that thought. Of course no one would *want* the thought. I am simply asking if in this instance you would be *willing* to have it. And it's more than that because in a way what you are being asked to do, is to be willing to have the thought and at the same time be willing to have the feelings that are tied to it. Engaging in this type of acceptance poses a challenge for everyone, but there is very sound evidence that when people do it they are freed up from the fear that comes with thoughts that we are not willing to have. You see, a big part of the burden these thoughts feel like is the weight of the fear of them and the instant need to get rid of that fear. In order to help you understand this, I am going to read you a short metaphor about acceptance.
>
> Accepting your thoughts and feelings is a bit like trying to cross a muddy swamp. Imagine that the swamp is full of dirt, rubbish and leftovers that smell really bad and really stink. What kind of thoughts would show up if you were wading through a dirty swamp like this? Well there would be: "I can't stand this" "This is unbearable" "I can't do anything this unpleasant or disgusting" "It's not worth the effort" "I just can't push my legs through this". All of these would likely show up. The best way you could possibly cross the swamp would be to notice all those thoughts and the distress they carry with them and let them be - to notice them and make room for them, while you keep crossing the swamp. It's like gathering them all up, putting them in a rucksack and carrying them on your back - rather than what you would be immediately tempted to do which is to try to throw them away. It's about being open to all the thoughts that may show up and the distress associated with them. It's about carrying them with you, while you keep doing what you were trying to do in the first place - that is crossing the swamp and reaching the other side. In the same way that you can embrace all the horrible

thoughts and feelings that show up while crossing the swamp, you could embrace all the negative thoughts that show up when you are writing a sentence like the last one.

Self-enhanced acceptance intervention. Participants in the self-enhanced acceptance condition received the above acceptance intervention, followed by an intervention with an emphasis on self that included a common ACT exercise called the Chessboard Metaphor. The instructions for the self-enhanced acceptance component were as follows:

> In this part of the experiment, we are going to play around with thoughts a little. It seems like an odd thing to do, but if you are learning to activate acceptance of your thoughts, you best know what you're dealing with. Try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and listen to my voice. If you find your mind wandering, just gently come back to the sound of my voice. For a moment now, turn your attention to yourself in this room. Picture yourself in the room and exactly where you are now. When you are ready, I want you to get in touch with how you felt when you wrote those sentences about the hypothetical accident. I mean just think of one single aspect of the scene. For example, try to imagine that X *(name of loved one)* is lying on the ground after the crash. I know this is difficult to do, but I want you to try as hard as you can to capture that single thought in your mind. And notice that almost immediately this thought pulls in feelings and emotions and they probably feel really bad. So what you are having right now is that nasty thought and all the nasty feelings that go with it.
>
> Now let's switch to a happy thought. Imagine that X *(name of loved one)* didn't die in the car accident and you are having a conversation with her/him on the phone this evening. Imagine, as much as you can, where she/he might be when she/he answers the phone. Try to capture that single thought in your mind. And notice that almost immediately this thought pulls in feelings and emotions that probably feel pretty good. So what you have right now is that happy thought and all the happy feelings that go with it. Now if you had to choose which of those thoughts to accept, it wouldn't be hard to know which one you'd pick. Because this is a far nicer place to be than the dark, black place that's full of negativity and dread I first asked you to think about.
>
> Ok so what we were just doing in that strange little exercise is noticing how your thoughts can come from two different extremes. On one hand, there are dark black thoughts and the nasty feelings that accompany them. And these are among the hardest things to accept and on the other extreme there are the bright, white thoughts and nice feelings that accompany them. And of course they are easy to accept and it would be nice to have as many of those as possible. The problem is that we are all happy to accept what we do not want and not happy at all in accepting what we don't want. In the next short exercise we are going to show you how acceptance works best when you don't have to pick and choose among different types of thoughts.
>
> I want you now to imagine a chessboard that goes out infinitely in all directions and is covered with black pieces and white pieces. These pieces work together in teams, as in chess - the white pieces fight against the black pieces. You can think of your thoughts and feelings as these pieces, they sort of hang out together in teams too. For example, "bad" feelings, like pain or hurt, hang out with "bad" thoughts, like a loved one in an accident. Same with the "good" ones. So it seems that the way the game is played is that we select the side we want to win. We put the "good" white pieces on one side and the "bad" black pieces on the other. Then we get up on the back of the white horse and ride to battle, fighting to win the war against the thoughts that bring pain. It's a war game. But there's a logical problem here and that is that from this position, huge portions of yourself are your own enemy. In fact, it is about half of you, half of the board, maybe more at

> times. And because, you've tried to fight the black by taking sides with the white you are now down at the same level of all of the pieces and if there are lots of black on the board, your side might even be outnumbered. In fact, as you fight the black pieces they become more central to your life, more habitual and more dominating. What you have been planning is to knock enough of them off the board so that you eventually dominate them with white pieces. And so, the battle goes on and on and that's because we cannot change the pieces on the board at any time. You have black pieces and you have white pieces and on many occasions you will have more black than white and so it seems you have to fight even harder, but you might still lose. Living with yourself as your own enemy is no way to live.
>
> So the way forward is to have full acceptance of all your thoughts and feelings, especially the black ones. And when you can do this, notice instead of being like a white piece that has to defend itself from black, you can adopt the position of the board. And when you are completely willing to have the black and the white as a part of you, sometimes even a big part, then you realise there is a you that can have these thoughts without needing to fight them. In fact, if you are the board you don't need to take any side with your thoughts, you can just be accepting of all types of thoughts.

Stage 6: Post-intervention distress induction procedure. This stage was identical to Stage 3.

Stage 7: Post-intervention VAS ratings and RQ. In the final stage of the experiment, participants completed their third exposure to the VASs and their second exposure to the RQ. This marked the end of the experiment, and participants were thanked and debriefed.

Results

Three main investigations were central to the current study. The first examined the effect of the distress induction procedure on discomfort, anxiety and stress. The second determined whether the self-enhanced condition would be associated with greater reductions in discomfort, anxiety and stress, relative to the acceptance condition. The third explored potential differences between the conditions in terms of participants' reactions to the imaginary accident.

Pre-experimental Measures

The pre-experimental outcomes for avoidance and mindfulness are presented in Table 3. The AAQ means were low (i.e. 14.83 and 14.13) for both conditions, thus within the normal range (i.e. < 18). The mean PHLMS scores for the acceptance sub-scale were also low (i.e. 30 and 28.25) and again within the normal range (< 31). Outcomes on the awareness sub-scale (i.e. 33.38 and 36.38) were also low and within the normal range (< 37). Three independent samples t-tests confirmed that the conditions did not differ significantly on any measure (all ps > .79).

Table 3
Means, Standard Deviations and Significance Values by Condition on the Pre-Experimental Measures in Experiment 2

Pre-experimental Measures	**Acceptance *M* (*SD*)**	**Self-enhanced *M* (*SD*)**	***p* values**
AAQ	14.83 (5.44)	14.12 (6.73)	.84
PHLMS (acceptance)	30 (4.81)	28.25 (7.13)	.57
PHLMS (awareness)	33.38 (4.78)	36.38 (3.78)	.19

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

The mean VAS ratings by condition at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded similarly low levels of discomfort (< 18/100) at baseline (see Figure 8). The acceptance condition showed a considerable increase in discomfort after the distress induction (+22), while the increase for the self-enhanced condition was more modest (+11). Thereafter, both conditions recorded almost no decrease in discomfort after the interventions (acceptance: -1.2; self-enhanced acceptance: -.05).

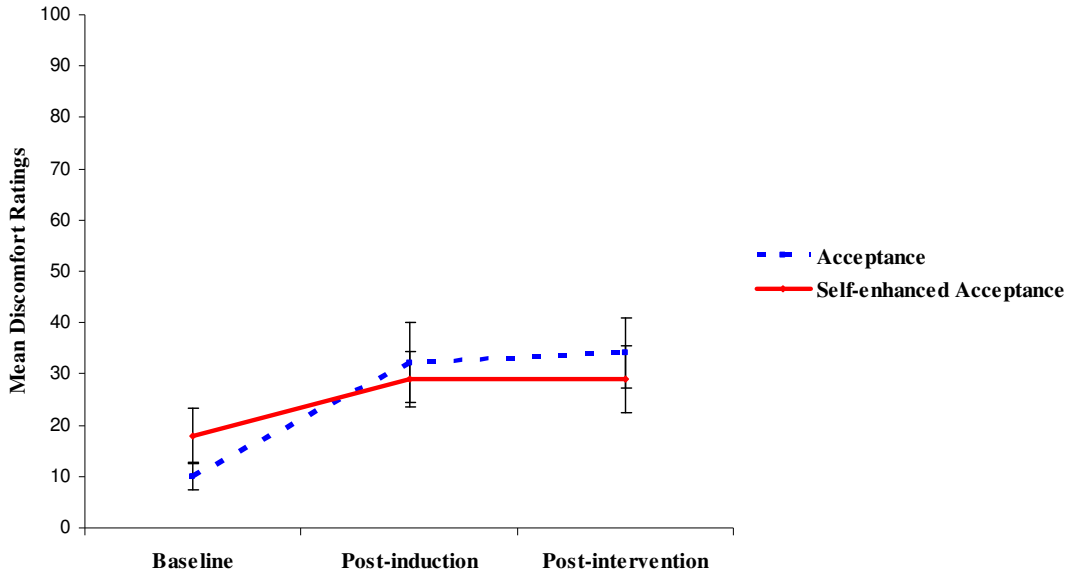


Figure 8. Mean discomfort ratings for each condition across time in Experiment 2.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .55, F (2, 21) = 8.72, p = .002, partial eta squared = .45], that accounted for a substantial amount of the variance (45 %), but not for condition [F (1, 22) = 0 p = .99, partial eta squared = .00]. The interaction effect was also non-significant [Wilks' Lambda = .91, [F (2, 21) = 1.1, p = .35, partial eta squared = .1]. Two dependent t-tests investigated which time point was influencing the significant effect. The results showed a significant increase in discomfort from baseline to post-induction (p = .002), but not from post-induction to post-intervention (p = .85).

Anxiety. Both conditions recorded similarly low levels of anxiety (< 15/100) at baseline, which increased similarly and modestly at post-induction (acceptance: +16.88; self-enhanced: +17.13; see Figure 9). Thereafter, there appeared to be no decrease in anxiety for acceptance and only a small decrease for self-enhanced acceptance (acceptance: -.06 and self-enhanced acceptance: -4.9).

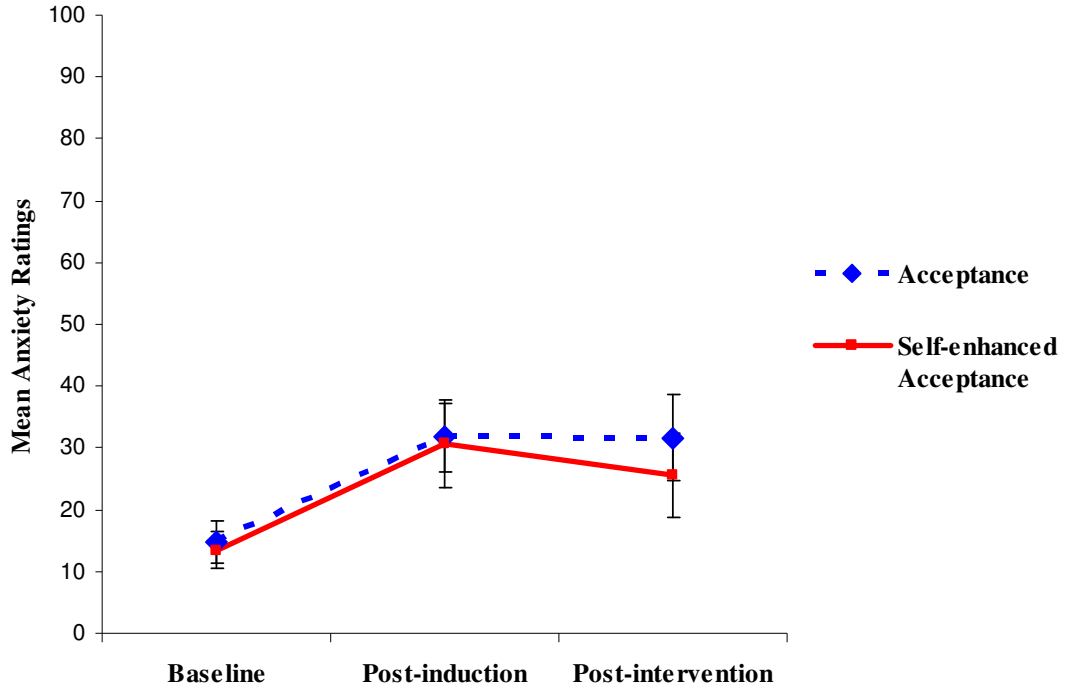
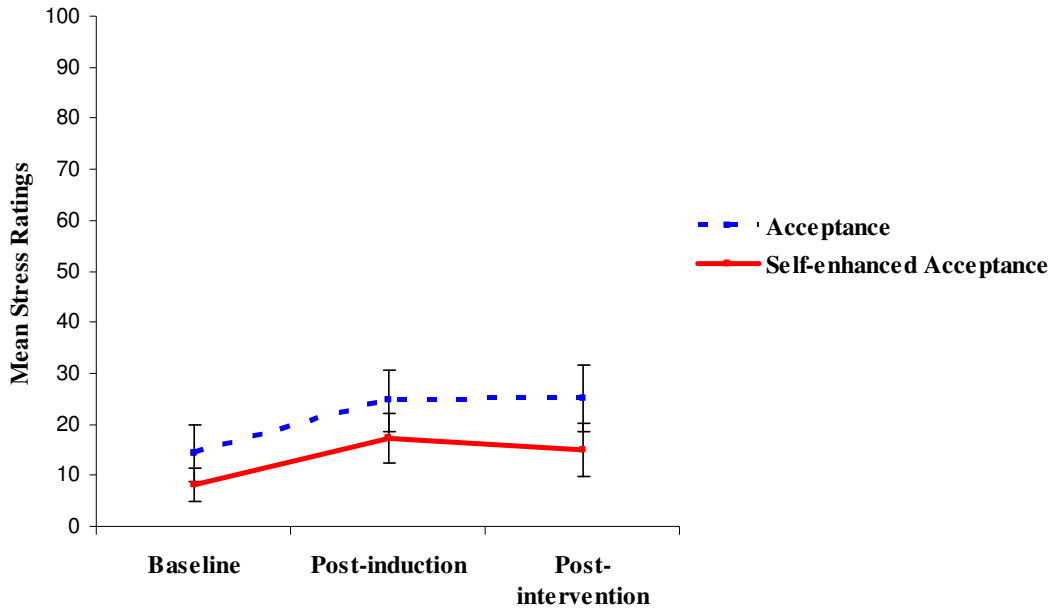


Figure 9. Mean anxiety ratings for each condition across time in Experiment 2.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .57, F (2, 21) = 8, p = .003, partial eta squared = .43] that accounted for a substantial amount of the variance (43%), but not for condition [F (1, 22) = .24, p = .63, partial eta squared = .01]. The interaction effect was also non-significant [Wilks' Lambda = .99, [F (2, 21) = 1.2, p = .89, partial eta squared = .09]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .0001), but not from post-induction to post-intervention (p = .62).

Stress. Both conditions recorded similarly low levels of stress (< 15/100) at baseline, which increased similarly and modestly after distress induction (acceptance: +10.32 and self-enhanced acceptance: +9.12; see Figure 10). After the intervention, the acceptance condition showed a small increase in stress (+.37), while the self-enhanced condition decreased stress marginally (-2.34).



Fi

gure 10. Mean stress ratings for each condition across time in Experiment 2.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .62, F (2, 21) = 6.56, p = .006, partial eta squared = .39] that accounted for a substantial amount of the variance (39%), but not for condition [F (1, 22) = .1.63, p = .22, partial eta squared = .07]. The interaction effect was also non-significant [Wilks' Lambda = .99, [F (2, 21) = .1, p = .90, partial eta squared = .01]. Two dependent t-tests showed a significant increase in stress from baseline to post-induction (p = .001), but not from post-induction to post-intervention (p = .80).

RQ Results

The mean RQ ratings on each of the six reactions to the distress induction at Stage 4 (post-induction) and at Stage 7 (post-intervention) are presented separately below. Table 4 presents the data from each of the six reactions by time point and by condition.

Table 4
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 2

Reactions Questionnaire	Time	Acceptance *M* (*SD*)	Self-enhanced *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the accident	Post-induction	48.12 (31.71)	38.59 (29.78)
	Post-intervention	55.2 (27.96)	40 (34)
Please rate how **believable** the accident scenario was to you	Post-induction	47.19 (30.55)	34.38 (29.74)
	Post-intervention	36.98 (29)	27.34 (23.77)
Please rate how **vivid** your thoughts and images were of the car accident	Post-induction	51.35 (32.42)	43.46 (29.47)
	Post-intervention	50.26 (28.59)	35.57 (30.53)
Please rate how much **guilt** you feel right now	Post-induction	37.76 (31.24)	50.55 (25.76)
	Post-intervention	28.9 (20.43)	32.5 (28.69)
Please rate how **morally wrong** you felt it was to write or say the sentence	Post-induction	35.98 (30.39)	46.02 (36.34)
	Post-intervention	36.15 (25.61)	38.35 (34.97)
Please rate how much you tried to **distract** from the sentence	Post-induction	47.53 (16.26)	43.72 (22.17)
	Post-intervention	40.75 (18.44)	29.86 (14.06)

Willingness. Ratings of willingness to engage with thoughts about the accident were low-moderate for both conditions (38.59-48.12/100; see Table 4) at post-induction and an

independent t-test revealed a non-significant difference between the conditions at this point (p = .24). Willingness increased marginally after the acceptance intervention (+7.08), but there was almost no change recorded in the self-enhanced condition (+1.41). Furthermore, a mixed between within 2x2 ANOVA revealed non-significant main effects for time, condition and the interaction effect (all ps > .28).

Believability. Ratings of believability of the accident were low-moderate for both conditions (34.38-47.19/100; see Table 4) and an independent t-test revealed a non-significant difference between the conditions at this point (p = .38). Believability decreased moderately for both groups after exposure to the interventions (acceptance: -10.21 and self-enhanced acceptance: -7.04). A mixed between within 2x2 ANOVA revealed non-significant main effects for time, condition and the interaction effect (all ps > .12).

Vividness. Vividness ratings of the accident were moderate (43.46/100) for the self-enhanced condition and moderate-high for acceptance (51.35/100) after the first distress induction (see Table 4). An independent t-test revealed a non-significant difference between the conditions at this point (p = .26). Vividness decreased at post-intervention for both groups, with the larger (albeit small) decrease recorded in the self-enhanced condition (-7.89) and a very marginal decrease in acceptance (-1.09). A mixed between within 2x2 ANOVA revealed non-significant main effects for time, condition and the interaction effect (all ps > .31).

Guilt. Ratings of guilt generated by the accident were moderate for the acceptance condition (37.76/100) and moderate-high for self-enhanced acceptance (50.55/100) after the first distress induction (see Table 4). An independent t-test revealed a non-significant difference between the conditions at this point (p = .29). Guilt decreased for both groups at post-intervention with a considerable decrease observed in the self-enhanced condition (-18.05) and a small decrease in acceptance (-8.86). While, a mixed between within 2x2 ANOVA revealed non-significant effects for condition and the interaction (both ps > .38),

time was significant [Wilks' Lambda = .8, F (1, 22) = 5.32, p = .03, partial eta squared = .20] and represented 20% of the variance. A paired sample t-test indicated that the significant effect for time was attributed to the self-enhanced condition (p = .04), while guilt reported by the acceptance condition did not change significantly across time (p > .34).

Moral Wrongness. Ratings of moral wrongness were low-moderate for acceptance (35.98/100) and moderate for the self-enhanced condition at post-induction (46.02/100; see Table 4). An independent t-test revealed a non-significant difference between the conditions at this point (p = .48). Moral wrongness increased (but only marginally) for acceptance (+.16), but decreased for self-enhanced acceptance (-7.66) after the interventions. A mixed between within 2x2 ANOVA indicated that the effects for time, condition and the interaction were not significant (all ps > .5).

Distraction. Distraction was moderate for both conditions at post-induction (43.72-47.53/100, see Table 4) and an independent t-test revealed a non-significant difference between the conditions at post-induction (p = .65). Distraction decreased for both groups at post-intervention, with the larger decrease recorded in the self-enhanced condition (-13.86), relative to acceptance (-6.78). However, a mixed between within 2x2 ANOVA revealed a significant main effect for time [Wilks' Lambda = .81, F (1, 22) = 5.13, p = .03, partial eta squared = .19] that accounted for a substantial amount of the variance (19%), but not for condition or the interaction (both ps > .26). A paired sample t-test indicated that the significant effect for time was attributed to the self-enhanced condition (p = .08), while distraction reported by the acceptance condition did not change significantly across time (p > .23).

Results Summary

The data from the pre-experimental measures indicated that participants in both conditions showed within normal range scores for avoidance and mindfulness and did not differ significantly in this regard. At baseline, discomfort, anxiety and stress were very low for both conditions, but all increased significantly at post-induction. After the interventions and the second distress induction, both anxiety and discomfort decreased marginally in both conditions. In contrast, stress decreased marginally in self-enhanced acceptance, but increased in acceptance, although the conditions did not differ significantly in this regard. Between the first distress induction and the interventions, both conditions generated increased willingness, as well as decreased: believability; vividness; guilt; and distraction. Moral wrongness increased for acceptance and decreased for self-enhanced acceptance.

Discussion

The primary aim of the current study was to investigate the utility of acceptance and self-enhanced acceptance interventions on subjective distress induced by the single-sentence paradigm. The key research prediction was that the self-enhanced acceptance intervention would show greater efficacy relative to acceptance alone in reducing discomfort, anxiety and stress. However, limited evidence for this key research prediction was uncovered.

The results did demonstrate consistencies with Experiment 1, in which the distress induction procedure significantly increased discomfort, anxiety and stress for both conditions. This again confirms the utility of the Rachman et al. (1996)'s paradigm in experimental distress induction. However, both interventions showed limited effects on reducing the dependent variables once distress was induced. Indeed, discomfort, anxiety and stress

remained higher than baseline at post-intervention in the self-enhanced acceptance condition and higher still in the acceptance condition.

The RQ showed some results consistent with ACT, such as an increase in willingness for both conditions after exposure to the interventions. Furthermore, although believability, vividness, guilt and distraction all decreased, this reduction was only significant for guilt and distraction in the self-enhanced acceptance condition only.

Experiment 3

Enhancing Defusion with Self as Context

Using an identical experimental design to the previous study, Experiment 3 investigated the relative utility of a *defusion-based* intervention vs. a *self-enhanced defusion* intervention in reducing experimentally induced distress. Once again, the research hypothesis predicted that the defusion intervention enhanced with self as context would show greater effects in the reduction of discomfort, anxiety and stress than the defusion intervention alone.

Method

Participants

Thirty-two volunteers participated in the current study. All were aged between 18 and 45 years old, were undergraduates from NUIM and were able to drive. The same exclusion criteria as Experiments 1 and 2 applied (2 participants were excluded on this basis). This yielded a final sample of 30 participants (16 males and 14 females; mean age = 24 years and 2 months) assigned randomly across two experimental conditions: defusion (N = 15) and self-enhanced defusion (N = 15).

Setting and Materials

All aspects of the setting and materials were identical to Experiment 2, except for the omission of the question referring to distraction in the RQ (due to experimenter error).

Ethical Issues

All ethical issues pertaining to Experiments 1 and 2 (see pp. 52-53) applied to the current study and were addressed in a similar manner. Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiment 2 (see Figure 7, p.68), except that the two interventions presented in Stage 5 comprised of a defusion exercise vs. a self-enhanced defusion exercise.

Stage 5: Interventions. Stage 5 involved a defusion intervention for half of the participants and a self-enhanced defusion intervention for the other half. The defusion intervention involved a common ACT exercise called the Physicalising Exercise, designed to create some distance between an individual and his/her physical feeling or sensation. Participants in the self-enhanced condition received one exposure to the defusion intervention, followed by an intervention designed to target self as context that was identical to Experiment 2.

Defusion intervention. Participants in the defusion condition received two identical and consecutive exposures to a defusion intervention (again to match for length between the conditions). Participants were instructed as follows:

> I understand that the previous story may have generated some unpleasant thoughts and feelings for you. The aim of the next part of the experiment is to teach you a coping strategy to deal with any negative thoughts or emotions that might have risen during the task.
>
> Try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and listen to my voice. If you find your mind wandering, just gently come back to the sound of my voice. When very painful thoughts come to mind, they are often accompanied by unpleasant sensations. For example, your chest may tighten or you might feel tense. This package of painful thoughts and unpleasant sensations often feels like it's too much to deal with. And when we have that very thought "this is too much", our level of discomfort goes even higher and then we feel like we are in a position where we really don't know what to do.

So imagine at this point in the experiment we asked you to consider thinking again about the thoughts and sensations that emerged for you when you were writing and saying the made-up sentence. Even though you know that your actions at that time have no connection to the future, you probably began to struggle with painful thoughts like "I can't do this" "This is wrong" "What if this came true" "I can't make my hand write this".

What I want you to do is take a negative thought that you showed up when you were writing the sentence. Isolate the thought in your mind. Now I want you to imagine yourself setting this thought outside of you, putting it out here on the table in front of you. Later we will take it back, so if it objects, let it know that. See if you can set it out in front of you on this table and let me know when you have it out there.

Now that you have set it in front of you, you are able to look at it and describe it for me. For example, can you tell me what colour this thought would be? *Participant answers.* Thank you. *A*nd if this thought had a size, can you tell me how big it would be? *Participant answers.* OK, now I am going to ask you to take the thought back off the table and back into you. And as you do this, notice any physical reaction to the thought as it arises. Notice that you were probably more willing to take the thought out and a little less willing to take it back.

It is natural to have some physical reactions to the negative thought. For example, your chest might tighten or your palms may become sweaty. So what I am going to ask you to do next is to take that reaction and also put it out in front of you. Now that it's out in front of you, you have a better perspective for describing it. Like before, can you tell me what colour this reaction would be if it had one? *Participant answers.* And if it had a size, how big would it be? *Participant answers.* OK, now I am going to ask you to take the reaction back off the table and back into you. And notice how you feel when you do this. Notice that you were probably more willing to take the reaction out and a little less willing to take it back.

OK, now we are going to repeat the same exercise again, but this time I want you to think of a different negative thought that came up when I asked you to write down the sentence. Isolate the thought in your mind. Like before, I want you to imagine yourself setting this thought outside of you, putting it out here on the table in front of you. Later we will take this back. Set it out in front of you on this table and let me know when you have it out there.

Now that you have it set in front of you, you are able to look at it and describe it for me. For example, can you tell me what colour this thought would be? *Participant answers.* Thank you. And if this thought had a size, can you tell me how big it would be? *Participant answers.* OK, now like before, I am going to ask you to take the thought back off the table and back into you. And notice as you do this, any physical reaction to the thought that arises for you. Notice that you were probably more willing to take the thought out and a little less willing to take it back in.

Now as we know, it is natural to have a reaction to a negative thought. So what I am going to ask you to do next is to take that reaction and also put it in front of you. Move the thought that's already on the table to one side and place the reaction to this thought beside it. Now that it's out in front of you, you have a better perspective for describing it. Like before, can you tell me what colour this reaction would be if it had one? *Participant answers.* And if it had a size, how big would it be? *Participant answers.* OK, now I am going to ask you to take the reaction back off the table and back into you. And notice how you feel when you do this. Notice that you were probably more willing to take the reaction out and a little less willing to take it back.

Self-enhanced defusion intervention. Participants in the self-enhanced defusion condition received one exposure to the defusion intervention, followed by the self as context intervention from Experiment 2 (see pp. 70-71).

Results

Again, three main investigations were central to the study: to assess the effect of the distress induction procedure on discomfort, anxiety and stress; to determine whether self-enhanced defusion would be associated with greater reductions in the dependent variables than defusion; and to explore potential differences between the conditions in terms of participant reactions to the imaginary accident.

Pre-experimental Measures

The pre-experimental outcomes for avoidance and mindfulness are presented in Table 5. The AAQ means for both conditions were at the reported mean for a non-clinical sample (i.e. 18.73). The PHLMS means on the acceptance sub-scale were low (27.6 and 28.6) and within the normal range (< 31). Outcomes on the awareness sub-scale (34.47 and 35.73) were also low and within the normal range (< 37). Three independent samples t-tests confirmed that the conditions did not differ significantly on any measure (all p's > .62).

Table 5

Means, Standard Deviations and Significance Values by Condition on the Pre-Experimental Measures in Experiment 3

Pre-experimental Measures	Defusion *M* (*SD*)	Self-enhanced *M* (*SD*)	*p* values
AAQ	18.73 (7.23)	19.73 (7.01)	.71
PHLMS (acceptance)	27.6 (7.99)	28.6 (6)	.7
PHLMS (awareness)	34.47 (7.92)	35.73 (5.75)	.62

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

The mean VAS ratings by condition recorded at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded similarly low levels of discomfort (<14/100) at baseline, which increased substantially after the distress induction procedure (defusion: +26.95; self-enhanced defusion: +34.83; see Figure 11). Thereafter, both conditions showed marginal increases in discomfort (defusion: +.73; self-enhanced defusion: +5.76) at post-intervention.

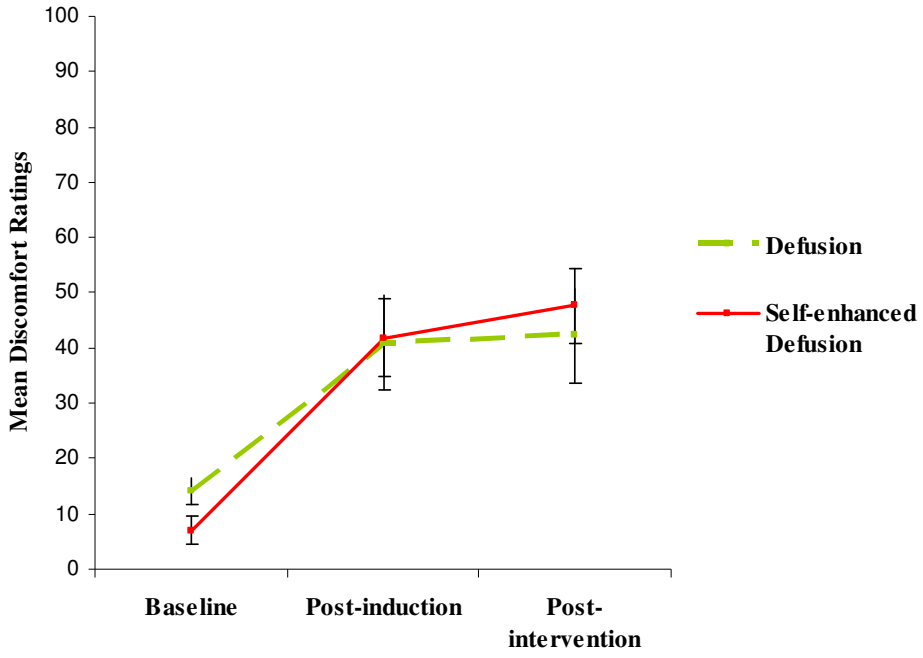


Figure 11. Mean discomfort ratings for each condition across time in Experiment 3.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .402 F (2, 27) = 20.09, p = .000, partial eta squared = .6] that represented a large (60%) amount of the variance, but not for condition [F (1, 28) = .38, p = .54, partial eta squared = .01]. The interaction effect was also non-significant [Wilks' Lambda = .98, [F (2, 27) = .26, p = .77, partial eta squared = .02]. Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .00), but not from post-induction to post-intervention (p = .34).

Anxiety Ratings. Both conditions recorded low anxiety (<13/100) at baseline, which increased substantially at post-induction (defusion: +30.1; self-enhanced defusion: +20.58; see Figure 12). Thereafter, the defusion condition showed a negligible decrease in anxiety (-.01), while the self-enhanced condition showed considerably increased anxiety (+10.21) at post-intervention.

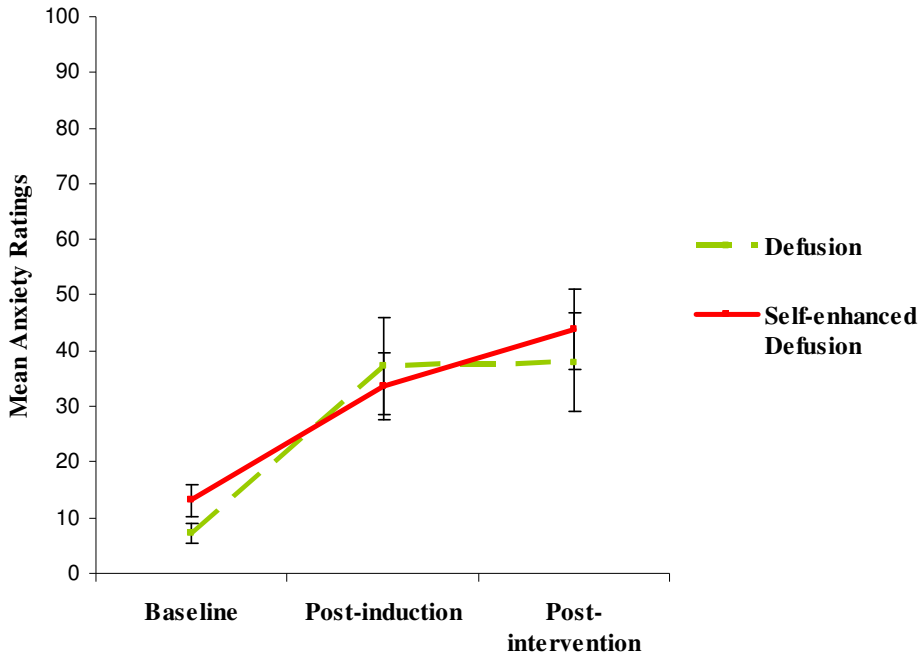


Figure 12. Mean anxiety ratings for each condition across time in Experiment 3.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .51 (2, 27) = 12.87, p = .000, partial eta squared = .49] that accounted for a substantial amount of the variance (49%), but not for condition [F (1, 28) = .15, p = .7, partial eta squared = .05]. The interaction effect was also non-significant [Wilks' Lambda = .9, [F (2, 27) = 1.4, p = .26, partial eta squared = .1]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p =.00). The change from post-induction to post-intervention was not significant (p = .08).

Stress. Both conditions recorded low stress (< 12/100) at baseline, which increased substantially at post-induction (defusion: +15.1 and self-enhanced defusion: +13.37; see Figure 13). Thereafter, both conditions showed small increases in stress (defusion: +6.87 and self-enhanced defusion: +4.65) at post-intervention.

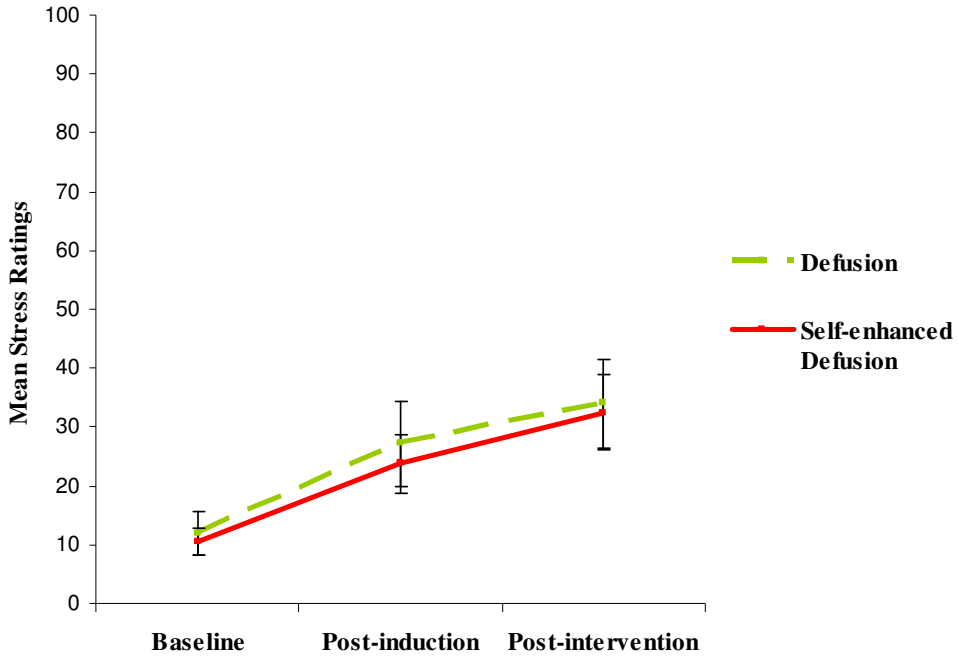


Figure 13. Mean stress ratings for each condition across time in Experiment 3.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .53 (2, 27) = 12.16, p = .000, partial eta squared = .47] that

represented a substantial amount of the variance (47%), but not for condition [F (1, 28) = .11, p = .74, partial eta squared = .00]. The interaction effect was also non-significant [Wilks' Lambda = .99, [F (2, 27) = .1, p = .91, partial eta squared = .00]. Two dependent t-tests showed a significant increase in stress from baseline to post-induction (p = .004) and from post-induction to post-intervention (p = .001).

RQ Results

The mean ratings on each of the six reactions to the distress induction at Stages 4 and 7 as measured on the RQ are presented separately below. Table 6 presents the data from each reaction by time point and condition.

Table 6
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 3

Reactions Questionnaire	Time	Defusion *M* (*SD*)	Self-enhanced *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the accident	Post-induction	47.13 (28.25)	49.98 (25.72)
	Post-intervention	38.33 (24.76)	51.13 (21.63)
Please rate how **believable** the accident scenario was to you	Post-induction	19.9 (20.81)	17 (23.88)
	Post-intervention	47.37 (29.84)	35.99 (30.23)
Please rate how **vivid** your thoughts and images were of the car accident	Post-induction	57.23 (29.44)	47.29 (29.34)
	Post-intervention	56.01 (24.66)	50 (31.01)
Please rate how much **guilt** you feel right now	Post-induction	45.96 (34.31)	37.49 (32.75)
	Post-intervention	48.83 (31.08)	39.94 (30.73)
Please rate how **morally wrong** you felt it was to write or say the sentence	Post-induction	41.28 (34.05)	54.83 (36.57)
	Post-intervention	47.55 (33.55)	43.58 (27.89)

At post-induction, levels of willingness and believability were similar for both conditions (see Table 6). However, participants in self-enhanced defusion showed less vividness and guilt than the acceptance condition, but more moral wrongness. A series of independent t-tests revealed that none of these differences between the conditions were significant (all ps > .33). At post-intervention, the defusion condition decreased willingness and vividness, while self-enhanced defusion increased both. Both conditions increased guilt and believability. Defusion increased moral wrongness while self-enhanced defusion decreased it. A series of 2x2 mixed between within ANOVAs revealed that the effect for time was significant for believability [Wilks' Lambda = .6 F(1, 28) = 18.96, p = .000, partial eta squared = .4] and that it represented a substantial amount of the variance (40%). Furthermore, the interaction effect was significant for moral wrongness [Wilks' Lambda = .82, F (1, 25) = 5.5, p = .03, partial eta squared = .18] and it accounted for a medium amount of the variance (18%) only (all other ps > .5).

Results Summary

The data from the screening measures indicated that the two groups did not differ pre-experimentally on their propensities towards acceptance or mindfulness. At baseline, both conditions were low in discomfort, anxiety and stress and these increased for both conditions at post-induction. A small difference emerged at post-intervention in the discomfort and anxiety ratings, where the self-enhanced defusion intervention increased both moderately and defusion increased both only marginally. Both conditions increased stress significantly at post-intervention. The RQ indicated some differences between conditions. Defusion decreased willingness and vividness, while the self-enhanced condition increased in both. Both conditions increased guilt and believability. Moral wrongness increased in defusion and decreased in self-enhanced defusion.

Discussion

As the second experiment in a series of four comparing key ACT hexaflex processes, the primary aim of Experiment 3 was to investigate the utility of a defusion vs. a self-enhanced defusion intervention on distress induced by the single-sentence paradigm. Once again, the key research prediction was that the self-enhanced defusion condition would show greater efficacy relative to defusion alone in reducing subjective ratings of discomfort, anxiety and stress. Similar to Experiment 2, however, this key research prediction was not upheld. In Experiment 4, we turned our attention to the third target ACT process, namely values, and employed the same design to explore the potential benefits of enhancing a standard values intervention with self as context to the reduction of distress.

Experiment 4

Enhancing Values with Self as Context

The aim of Experiment 4 was to investigate the relative utility of a values-based intervention vs. a self-enhanced values intervention in reducing experimentally induced distress, using the single-sentence paradigm. As before, the research hypothesis was that a values intervention enhanced with self as context would show greater effects in the reduction of subjective levels of discomfort, anxiety and stress compared to a values intervention alone.

Method

Participants

Twenty volunteers participated in Experiment 4. All were aged between 19 and 23 years old, were undergraduates at NUIM and were able to drive. The same exclusion criteria as previous experiments applied (4 participants were excluded on this basis). This yielded a final sample of 16 participants (6 male and 10 female, mean age = 20 years, 3 months) assigned randomly across two experimental conditions: values (N = 8) and self-enhanced values (N = 8).

Setting and Materials

All aspects of the setting and materials were identical to Experiments 2 and 3 (notably the distraction question previously omitted from the RQ as a result of experimenter error was now re-introduced).

Ethical Issues

All ethical issues pertaining to the previous experiments applied here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiment 2 (see Figure 7, p.68), except that the two interventions presented in Stage 5 comprised of a values exercise and a self-enhanced values exercise.

Stage 5: Interventions. Stage 5 involved a values intervention for half of the participants and a self-enhanced values intervention for the other half. Participants in the values condition received two identical and consecutive exposures to the values intervention (again this was to match for length between conditions). Participants in the self-enhanced value condition received one exposure to the values intervention followed by the same self as context intervention used in previous experiments.

Values intervention. Participants in the values intervention were instructed as follows:

> I understand that the previous sentence may have generated some unpleasant thoughts and feelings for you. The aim of the next part of this experiment is to discuss the importance of your participation in this research. This may have the bonus of helping you deal with any negative thoughts or emotions that came up as a result of the sentence. OK, so if you can, try to relax yourself in your chair and get comfortable. When you're ready, I want you to close your eyes and listen to the sound of my voice. If you find your mind wandering, just gently come back to the sound of my voice.
>
> As you may know, many people suffer with mental health issues and the number of cases of issues like depression and anxiety in Ireland are on the increase. However many people with mental health issues learn to persist in their lives or keep working in their jobs, even when they are experiencing very high levels of discomfort. For example, going to work may be the only way they can afford to feed their children. In the same way, someone who is afraid of flying might be willing to put themselves in the uncomfortable position of being on an airplane so they can go on holidays with their family. Bearing these two examples in mind, do you think you could you tell me something that you value? For example, as this experiment is dealing with mental health, would it be fair to say that you value your mental health?
>
> *Participant answers.*

> OK, now thinking again about the previous examples, I just want to bring your attention to the fact that these people keep living their lives even when they are faced with distressing problems or uncomfortable circumstances. We know that your participation in the previous part of this experiment was uncomfortable and distressing but, in actual fact, being able to carry out this experiment could be beneficial to your mental health. This is based on research that has shown that avoiding negative emotions can be bad for one's mental health, whereas being able to make contact with and accept distressing thoughts and feelings can have positive outcomes for one's mental health.
>
> Now, at this point in the experiment we want you to ask yourself if you would be willing to make contact with your own feelings of distress, if doing so could allow you to move in the direction of something you value. In this case, that is your positive mental health. So what we are asking you to consider is if you would be willing to experience a brief period of distress when it is in the service of something you value, that is, the strengthening of your ability to be out of your comfort zone and subsequently, strengthening your mental health.

Self-enhanced values intervention. Participants in the self-enhanced values condition were first presented with the values intervention outlined above and subsequently presented with the self as context intervention, identical to Experiments 2 and 3 (see pp. 70-71).

Results

Again, three investigations were central to Experiment 4: to assess the effect of the distress induction procedure on discomfort, anxiety and stress; to determine whether self-enhanced values would be associated with greater reductions than values alone in these dependent variables; and to explore potential differences between the conditions in terms of participant reactions to the imaginary accident.

Pre-Experimental Measures

The pre-experimental outcomes for avoidance and mindfulness are presented in Table 7. The AAQ means for both conditions were low and within the normal range for a non-clinical sample (i.e. < 18). The PHLMS scores on the acceptance sub-scale were low (i.e. 27 and 25.5) and again within the normal range (< 31). Outcomes on the awareness sub-scale (i.e. 33.75 and 34.75) were also low and within the normal range (< 37). Three independent

samples t-tests confirmed that the conditions did not differ significantly on any measure (all p's > .3).

Table 7
Means, Standard Deviations and Significance Values by Condition on the Pre-Experimental Measures in Experiment 4

Pre-experimental Measures	**Values *M* (*SD*)**	**Self-enhanced *M* (*SD*)**	***p* values**
AAQ	12.75 (4.33)	14 (2.98)	.33
PHLMS (acceptance)	27 (5.8)	25.5 (5.04)	.6
PHLMS (awareness)	33.75 (5.42)	34.75 (7.32)	.76

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

The mean VAS ratings by condition recorded at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded similarly low levels of discomfort (<13/100) at baseline, which increased substantially at post-induction (values: +19 and self-enhanced values: +20.12; see Figure 14). Thereafter, both conditions increased discomfort (values: +.5.88 and self-enhanced values: +9.38) at post-intervention.

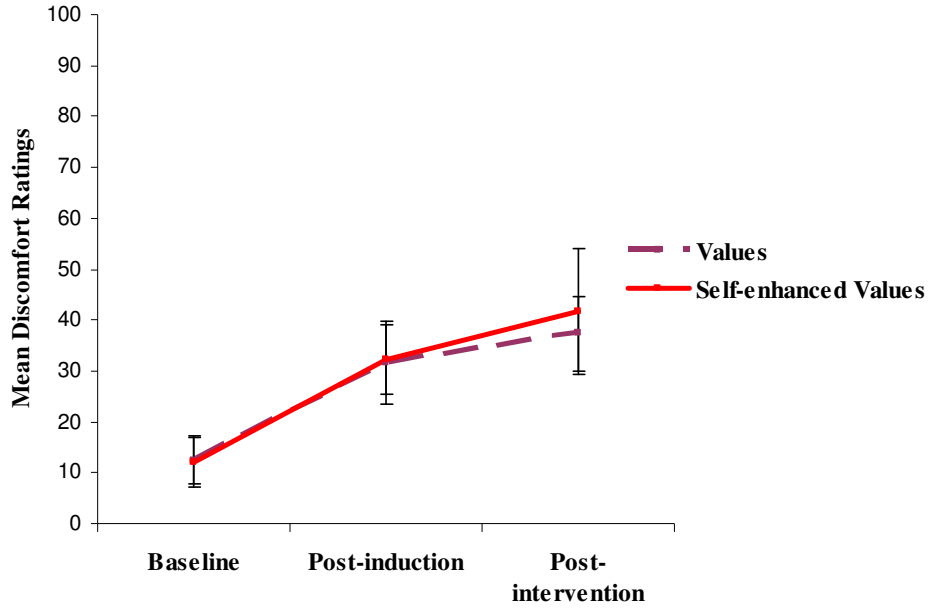


Figure 14. Mean discomfort ratings for each condition across time in Experiment 4.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .405, F (2, 13) = 9.56, p = .003, partial eta squared = .6] that accounted for a large amount of the variance (60%), but not for condition [F (1, 14) = .031, p = .86, partial eta squared = .00]. The interaction effect was also non-significant [Wilks' Lambda = .98, F (2, 13) = .08, p = .92, partial eta squared = .01]. Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .00), but not from post-induction to post-intervention (p = .16).

Anxiety. Both conditions recorded low levels of anxiety (< 9/100) at baseline, which increased substantially at post-induction (values: +15.75 and self-enhanced values: +16.28; see Figure 15). Thereafter, both conditions increased anxiety further (values: +2.75 and self-enhanced values: +11.87) at post-intervention.

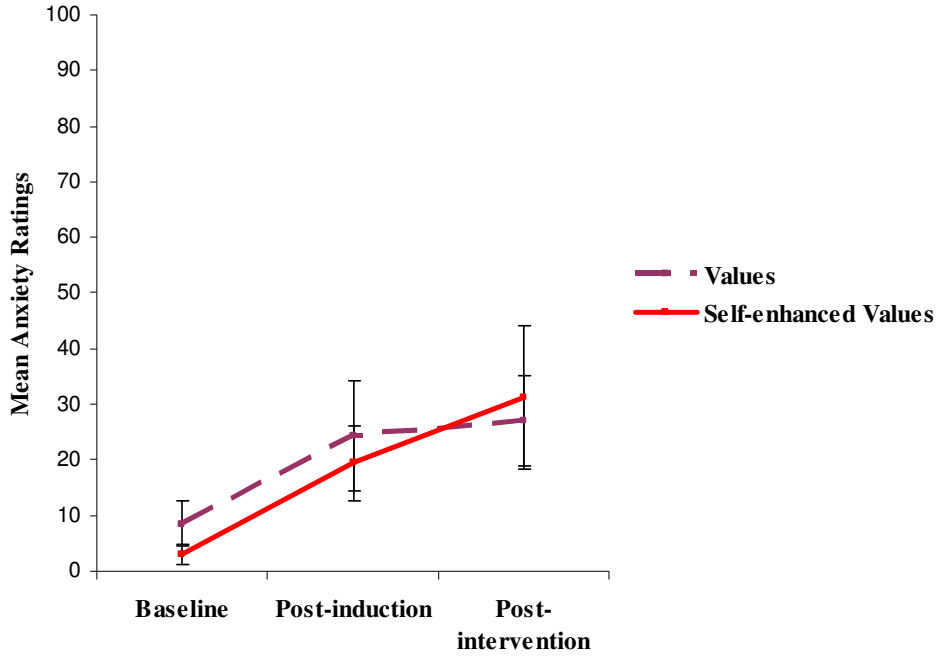


Figure 15. Mean anxiety ratings for each condition across time in Experiment 4.

A mixed between within 3x2 ANOVA revealed a significant main effect for time [Wilks' Lambda = .59 F (2, 13) = 4.58, p = .03, partial eta squared = .41] that accounted for a substantial amount of the variance (41%), but not for condition [F (1, 14) = .05, p = .83, partial eta squared = .00]. The interaction effect was also non-significant [Wilks' Lambda = .94, F (2, 13) = .43, p = .66, partial eta squared = .06]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .02), but not from post-induction to post-intervention (p = .15).

Stress. Both conditions recorded low levels of stress (< 12/100) at baseline, which increased after the distress induction procedure (values: +6.12; self-enhanced values: +19.25; see Figure 16). Thereafter, the values condition decreased stress marginally (-4.75) while the self-enhanced condition increased stress (+6.25). A mixed between within 3x2 ANOVA revealed non-significant effects for time, condition and the interaction effect (all ps > .2). No dependent t-tests were performed due to the non-significant effect for time.

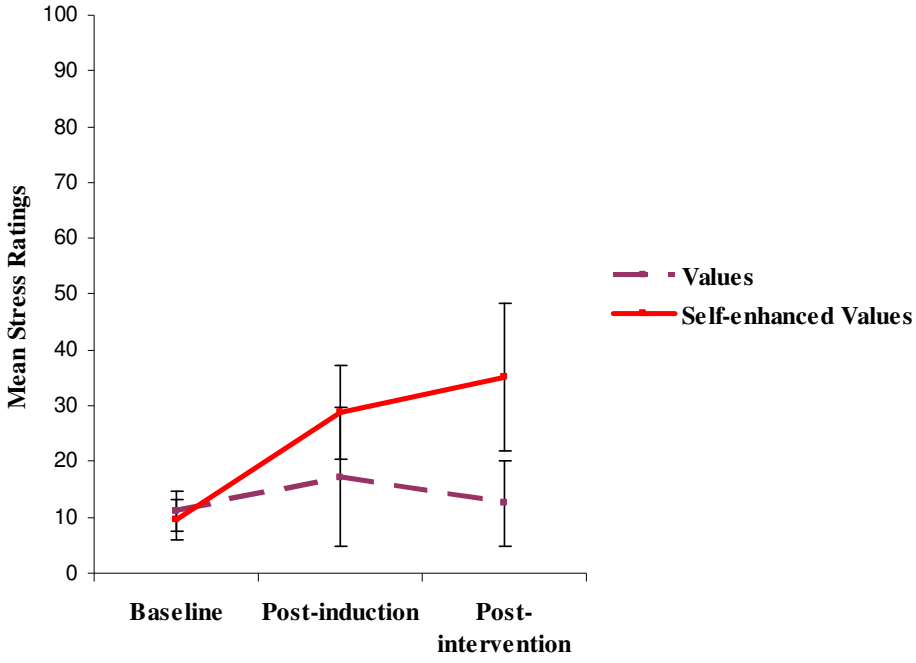


Figure 16. Mean stress ratings for each condition across time in Experiment 4.

RQ Results

The mean ratings on each of the six reactions to the distress induction at Stages 4 and 7 are presented separately below. Table 8 presents the data from each of the six reactions by time point and condition.

Table 8

The Means and Standard Deviations for the RQ across Time and Condition in Experiment 4

Reactions Questionnaire	Time	Values *M* (*SD*)	Self-enhanced *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the accident	Post-induction	26.33 (38.59)	37.13 (27.12)
	Post-intervention	36.5 (36.93)	35.13 (27.54)
Please rate how **believable** the accident scenario was to you	Post-induction	21.25 (22.87)	38.28 (26.83)
	Post-intervention	17.25 (17.48)	54 (31.81)
Please rate how **vivid** your thoughts and images were of the car accident	Post-induction	28.25 (32.73)	47.38 (38.46)
	Post-intervention	26.75 (29.51)	54.75 (33.08)
Please rate how much **guilt** you feel right now	Post-induction	43.5 (36.97)	58.38 (30.9)
	Post-intervention	26.75 (31.07)	56.88 (38.24)
Please rate how **morally wrong** you felt it was to write or say the sentence	Post-induction	62.13 (22.34)	73.25 (26.91)
	Post-intervention	46.25 (39.05	56.13 (31.27)
Please rate how much you tried to **distract** from the sentence	Post-induction	25.75 (23.27)	47.37 (32.40)
	Post-intervention	60.13 (22.34)	59.5 (16.67)

At post-induction, levels of willingness, believability, vividness, guilt, moral wrongness and distraction were higher for the self-enhanced condition relative to the values condition. A series of independent t-tests revealed that none of these differences were significant (all ps > .14). At post-intervention, the values condition increased willingness, while self-enhanced values decreased it. Believability and vividness decreased for contact and increased for self-enhanced contact. Guilt and moral wrongness decreased in both conditions and distraction increased in both conditions. A series of 2x2 mixed between within ANOVAs revealed a significant effect for time for distraction was significant [Wilks'

Lambda = .71 F (1, 14) = 5.7, p = .03, partial eta squared = .29] which represented a medium amount of variance (29%). In addition, the effect for moral wrongness was significant [Wilks' Lambda = .62 F (1, 14) = 8.7, p = .01, partial eta squared = .38] and represented a medium amount of variance (38%) (all other ps > .17).

Results Summary

The data from the pre-experimental measures indicated that the two groups showed within normal range scores of avoidance or mindfulness and did not differ significantly in this regard. At baseline, both conditions were low on discomfort, anxiety and stress and both increased significantly on all three ratings at post-induction. After the interventions and the second distress induction, both anxiety and discomfort increased in both conditions. In contrast, stress decreased to near baseline for thee values condition and increased in the self-enhanced values condition. At post-intervention, the values condition increased willingness, while self-enhanced values decreased it. Believability and vividness decreased for values and increased for self-enhanced values. Guilt and moral wrongness decreased in both conditions and distraction increased in both conditions.

Discussion

As the third experiment in a series of four comparing ACT hexaflex processes, the primary aim of Experiment 4 was to investigate the utility of a values vs. a self-enhanced values intervention on distress induced by the single-sentence paradigm, using an experimental design identical to previous experiments. Once again, the key research prediction was that the self-enhanced values condition would show greater efficacy relative to values alone in reducing subjective ratings of discomfort, anxiety and stress. Similar to

Experiments 2 and 3, however, this research prediction was not upheld. In Experiment 5, we turned our attention to the fourth target ACT process, namely contact with the present moment and employed the same design to explore the potential benefits of enhancing a standard contact with the present moment intervention with self as context.

Experiment 5

Enhancing Contact with the Present Moment with Self as Context

In Experiment 5, we turned our attention to the fourth target ACT process, namely contact with the present moment, and employed the same design to explore the potential benefits of enhancing a standard contact with the present moment intervention with self as context, using Rachman et al. (1996)'s single-sentence paradigm. The research hypothesis predicted that the contact with the present moment intervention enhanced with self as context would show greater effects in the reduction of subjective discomfort, anxiety and stress than contact with the present moment alone.

Method

Participants

Twenty-three volunteers participated in Experiment 5. All were aged between 18 and 22 years old, were undergraduates at NUIM and were able to drive. The same exclusion criteria as previous experiments applied (3 participants were excluded on this basis). This yielded a final sample of 20 participants (7 males and 13 females, mean age: 19 years, 8 months) assigned randomly across two experimental conditions: contact with the present moment (N =10) and self-enhanced contact with the present moment (N =10). In the interests of brevity, the term 'contact with the present moment' will be shortened hereafter to simply 'contact'.

Setting and Materials

All aspects of the setting and materials were identical to previous experiments.

Ethical Issues

All ethical issues pertaining to previous studies applied here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiments 2, 3 and 4 (see Figure 7, p.68), except that the two interventions presented in Stage 5 comprised of a contact exercise vs. a self-enhanced contact exercise.

Stage 5: Interventions. Stage 5 involved a contact intervention for half of the participants and a self-enhanced contact intervention for the other half.

Contact with the present moment intervention. There are no exercises listed in the original full-length book on ACT (Hayes et al., 1999) that explicitly target contact with the present moment, because this term is a relatively recent addition to ACT protocols and is borrowed directly from mindfulness practices. Indeed, ACT therapists who choose to target contact with the present moment invariably use a mindfulness technique and often the Body Scan (Kabat-Zinn, 1994). In line with this practice, we used the Body Scan technique here to target contact with the present moment, but have retained the term contact in order to stay close to ACT language and practices. We will discuss the benefits and disadvantages of this type of labelling in the General Discussion.

In line with Experiments 2-4, we also investigated the extent to which a contact exercise might be enhanced with a self as context technique in terms of distress reduction. Participants in this latter condition received two identical and consecutive exposures to a contact intervention. Participants were instructed as follows:

> I understand that the previous sentence may have generated some unpleasant thoughts and feelings for you. The aim of the next part of the experiment is to teach you a coping strategy to deal with any negative sensations that might have risen when you were asked

to say and write the sentence. Try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and listen to my voice.

When very painful thoughts come to mind they are often accompanied by unpleasant sensations. For example, your chest might tighten or you might feel tense. This package of painful thoughts and unpleasant sensations often feels like it's too much to deal with. And when we have that very thought "this is just too much", our level of discomfort goes even higher and then we feel like we are in a position where we really don't know what to do.

Powerful feelings such as anxiety or sadness can often be expressed as effects in the body. For example, tightness in the chest may signal the presence of strong feelings like in the last part of this experiment. As a result, some believe that learning about the body will be helpful in learning how better to deal with feelings and emotions.

For the next part of the experiment, focus your attention on your breathing. Try to feel the rising and falling of your belly with each in-breath and out-breath you take. Take a few moments to feel your body as a whole, from head to toe. For example, try to feel the sensations of your back touching the chair or the feeling of your feet on the ground.

For now, try to bring your attention to the toes of your left foot. As you direct your attention to them, see if you can direct, or channel, your breathing to them as well, so that it feels as if you are breathing to them as well, so that it feels as if you are breathing into your toes and out from your toes. It may take a while for you to get the hang of this. It may help to just imagine your breath traveling down the body from your nose into the lungs and then continuing through the abdomen and down the left leg all the way to the toes...and then back again and out through your nose.

Allow yourself to feel any and all sensations from your toes, perhaps distinguishing between them and watching the flux of sensations in this region. If you don't feel anything at the moment, that is fine too. Just allow yourself to feel "not feeling anything".

When you are ready to leave the toes and move on, take a deeper, more intentional breath in all the way down to the toes and on the outbreath, allow them to dissolve in your mind's eye. Stay with your breathing for a few breaths and then move on in turn to the sole of your foot... the heel... the top of your foot... and then the ankle....all the time continuing to breathe into and out of the foot, continuing to breathe into and from each region as you observe the sensations that you are experiencing and then letting go of it and moving on. If your attention wanders off, it is important that you bring your mind back to the breath and to the region you are focusing on.

In this way, continue to move slowly up your left leg and through the rest of your body as you maintain the focus on the breath and on the feeling of the particular regions as you come to them, breathe with them and let go of them. Go to the stomach....all the way up to your shoulders...down to your elbows... and all the way to your finger tips. In the same way, start at the base of your neck... move to your chin... to your nose... all the way to our forehead. When you have reached the top of your head, let me know. However, as you move through the body try to remember the basic instructions of the exercise; that is to bring your awareness to a particular region of the body, to hold it in awareness for a short time and finally to release and "let go" of that region before moving your attention to the next region.

Self-enhanced contact with the present moment intervention. Participants in the self-enhanced condition received one exposure to the contact intervention followed by the self as context exercise which used in Experiments 1-4 (see pp. 70-71).

Results

Again, three investigations were central to Experiment 5: to assess the effect of the distress induction procedure on discomfort, anxiety and stress; to determine whether self-enhanced contact would be associated with greater reductions in discomfort, anxiety and stress than contact alone; and to explore potential differences between the conditions in terms of participant reactions to the imaginary accident.

Pre-experimental Measures

The pre-experimental outcomes for avoidance and mindfulness are presented in Table 9. The AAQ means for both conditions were low and within the normal range for a non-clinical sample (i.e. < 18). The PHLMS means on the acceptance sub-scale were low (27.6 and 26.9) and again within the normal range (< 31). Outcomes on the awareness sub-scale (35.2 and 33.2) were also low and within the normal range (< 37). Three independent samples t-tests confirmed that the conditions did not differ significantly on any measure (all p's > .2).

Table 9
Means, Standard Deviations and Significance Values by Condition on the Pre-Experimental Measures in Experiment 5

Pre-experimental Measures	**Contact** ***M*** **(*SD*)**	**Self-enhanced** ***M*** **(*SD*)**	***p*** **values**
AAQ	14.9 (3.9)	17.6 (8.3)	.2
PHLMS (acceptance)	27.6 (5.56)	26.9 (4.36)	.76
PHLMS (awareness)	35.2 (7.18)	33.2 (3.33)	.44

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

The mean VAS ratings by condition recorded at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded low discomfort (< 10/100) at baseline, which increased substantially at post-induction (contact: +28.3; self-enhanced contact: +29.8; see Figure 17). Thereafter, both conditions decreased discomfort marginally (contact: -1.7; self-enhanced contact: -.01) at post-intervention.

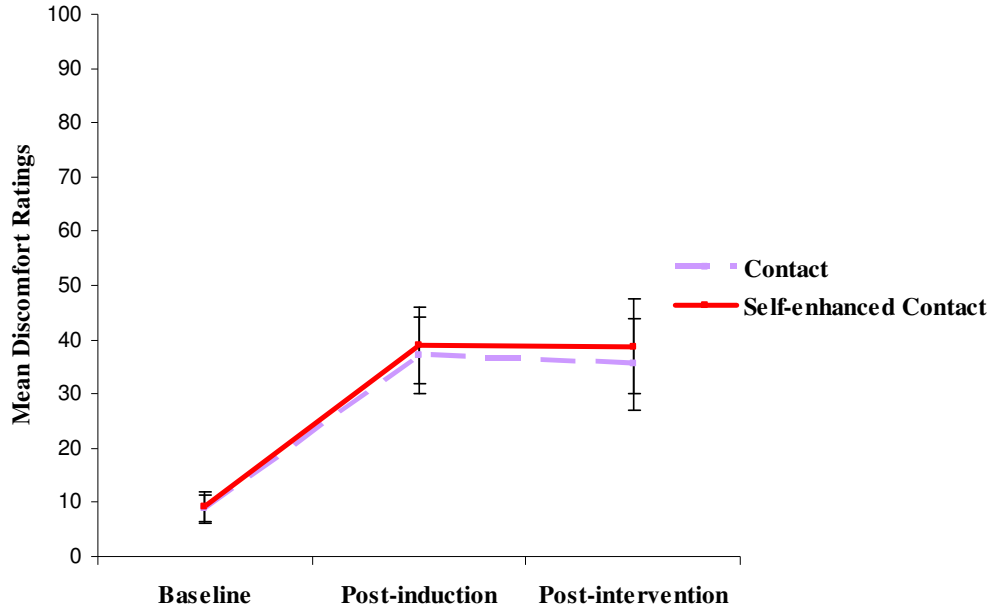


Figure 17. Mean discomfort ratings for each condition across time in Experiment 5.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .32, F (2, 17) = 17.75, p = .000, partial eta squared = .68] that accounted for a large amount of the variance (68%), but not for condition [F (1, 18) = .07, p = .79, partial eta squared = .004]. The interaction effect was also non-significant [Wilks' Lambda = .99, F (2, 17) = .03, p = .97, partial eta squared = .00]. Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .00), but not from post-induction to post-intervention (p = .87).

Anxiety. Both conditions recorded low anxiety (< 11/100) at baseline, which increased substantially at post-induction (contact: +29.2; self-enhanced: +21.1; see Figure 18). Thereafter, contact decreased anxiety slightly (-2.1) and self-enhanced contact increased anxiety marginally (+.3) at post-intervention.

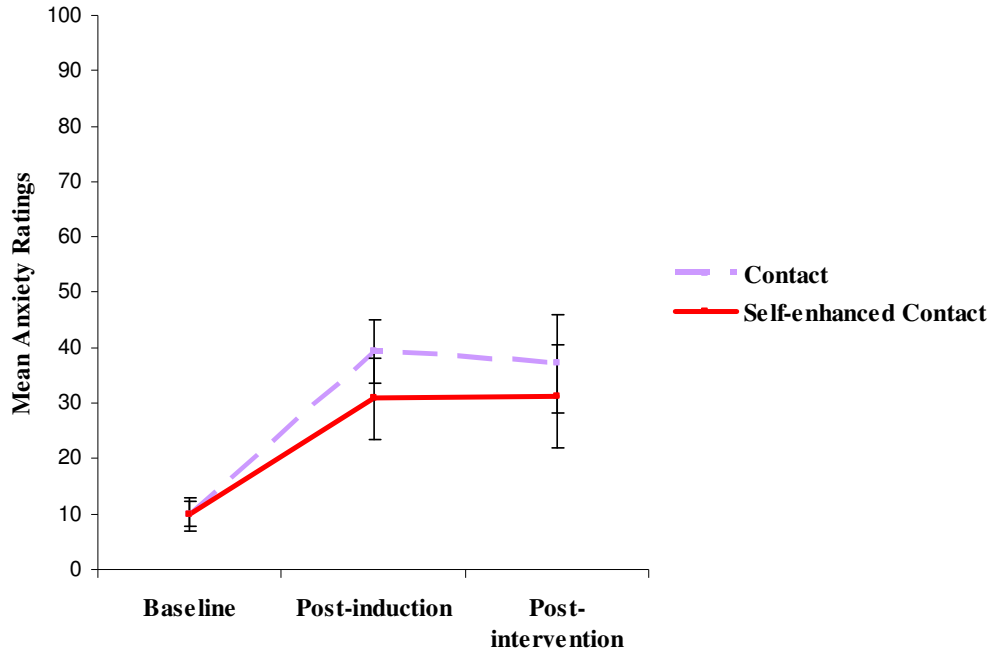


Figure 18. Mean anxiety ratings for each condition across time in Experiment 5.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .39, F (2, 17) = 13.46, p = .000, partial eta squared = .61] that accounted for a large amount of the variance (61%), but not for condition [F (1, 18) = .55, p = .47, partial eta squared = .03]. The interaction effect was also non-significant [Wilks' Lambda = .96, F (2, 17) = .35, p = .7, partial eta squared = .00]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .00), but not from post-induction to post-intervention (p = .83).

Stress. Both conditions recorded low stress (< 15/100) at baseline, which increased substantially at post-induction (contact: +18.2; self-enhanced contact: +14.6; see Figure 19).

Thereafter, contact increased stress at post-intervention (+5), while self-enhanced contact decreased stress marginally (- 4.1).

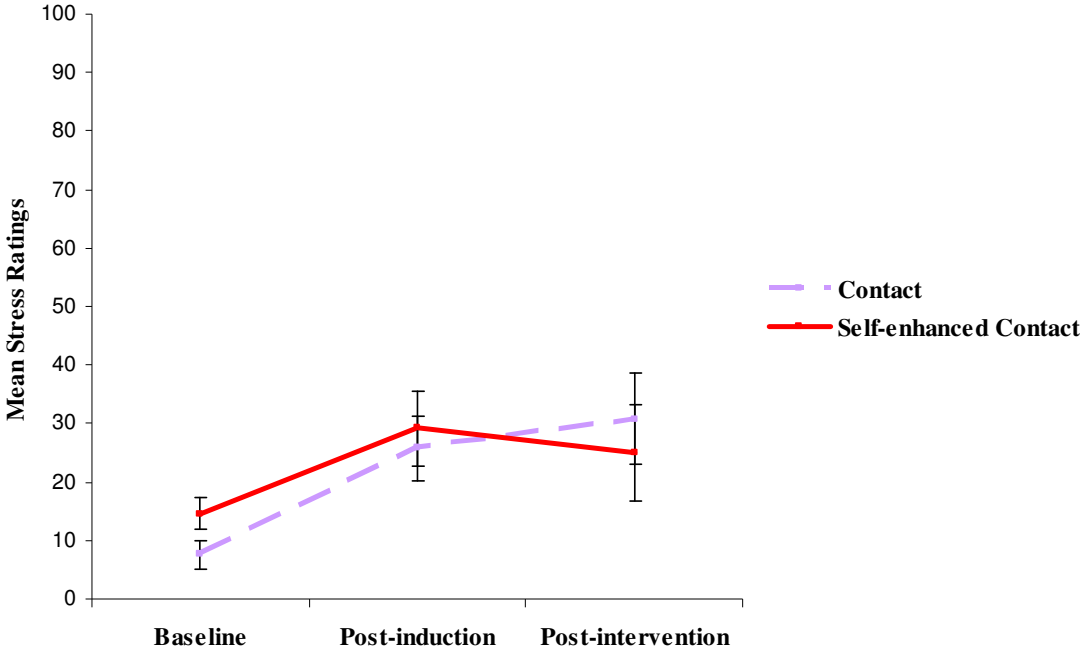


Figure 19. Mean stress ratings for each condition across time in Experiment 5.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .54, F (2, 17) = 7.37, p = .005, partial eta squared = .46] that accounted for a substantial amount of the variance (46%), but not for condition [F (1, 18) = .08, p = .78, partial eta squared = .01]. The interaction effect was also non-significant [Wilks' Lambda = .94, F (2, 17) = .51, p = .61, partial eta squared = .06]. Two dependent t-tests showed a significant increase in stress from baseline to post-induction (p = .001), but not from post-induction to post-intervention (p = .93).

RQ Results

The mean ratings on each of the six reactions to the distress induction at Stages 4 and 7 are presented separately below (see Table 10).

Table 10
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 5

Reactions Questionnaire	Time	Contact *M* (*SD*)	Self-enhanced *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the accident	Post-induction	35.2 (20.82)	30.8 (28.87)
	Post-intervention	20.9 (20.99)	43.9 (30.19)
Please rate how **believable** the accident scenario was to you	Post-induction	58 (28.03)	38 (34.71)
	Post-intervention	42 (33.09)	45.3 (36.01)
Please rate how **vivid** your thoughts and images were of the car accident	Post-induction	56.8 (33.3)	29 (23.17)
	Post-intervention	37.3 (34.82)	31.8 (26.59)
Please rate how much **guilt** you feel right now	Post-induction	64 (26.71)	41.7 (20.92)
	Post-intervention	48.5 (21.75)	41.1 (32.6)
Please rate how **morally wrong** you felt it was to write or say the sentence	Post-induction	87.7 (12.86)	48.2 (41.22)
	Post-intervention	68.9 (23.21)	47.5 (31.73)
Please rate how much you tried to **distract** from the sentence	Post-induction	54.6 (30.58)	40.8 (33.29)
	Post-intervention	53.7 (29.43)	37.2 (29.28)

At post-induction, levels of willingness were similar for both conditions. In contrast, believability, vividness, guilt, moral wrongness and distraction were higher for the contact condition, relative to the self-enhanced condition. However, a series of independent t-tests revealed that these differences were only significant for vividness (p = .04), guilt (p = .05) and moral wrongness (p = .01). At post-intervention, guilt, moral wrongness and distraction decreased for both conditions (although the decrease was generally bigger for contact). In contrast, the self-enhanced contact condition increased willingness, vividness and believability while the contact condition decreased these. A series of 2x2 ANOVA revealed a significant interaction effect for willingness [Wilks' Lambda = .74, F (1, 18) = 6.3, p = .02,

partial eta squared = .26] that accounted for a medium amount of the variance (26%), believability [Wilks' Lambda = .74, F (1, 18) = 6.31, p = .02, partial eta squared = .26] that accounted for a medium amount of the variance (26%) and vividness [Wilks' Lambda = .8, F (1, 18) = 4.6, p = .05, partial eta squared = .2] that also accounted for a medium amount of the variance (20%) only (all other ps > .12).

Results Summary

The data from the pre-experimental measures indicated that the conditions did not differ on propensities towards avoidance or mindfulness at baseline. Both conditions were low on discomfort, anxiety and stress at baseline and all three sets of ratings increased significantly at post-induction for both conditions. Varying results emerged at post-intervention. Both conditions showed small decreases in discomfort. The contact condition decreased anxiety and increased stress, while the self-enhanced condition increased anxiety and decreased stress (although these differences were not significant). As such, the research prediction that the self-enhanced condition would be associated with significantly greater increases in the dependent variables was not confirmed. Results from the RQ that guilt, moral wrongness and distraction decreased for both conditions (although the decrease was generally bigger for contact). In contrast, the self-enhanced contact condition increased willingness, vividness and believability while the contact condition decreased these.

Discussion

Experiment 5 was the final in a series of four exploring ACT hexaflex processes (acceptance, defusion, values and contact with the present moment) and their potential relationship with self as context. In all four studies, none of the conditions successfully reduced discomfort, anxiety or stress to near baseline levels. Furthermore, none of the

predictions that the self-enhanced conditions would show superiority in this regard were upheld.

The surprising consistency across the findings from the four studies had two main implications. Although there are only a few similar studies that have subjected the current self-report measures to analogue interventions in the context of experimentally induced distress, those findings do not accord with the current ones. 2. It is possible that although the current method of distress induction reliably increased discomfort, anxiety and stress, it may not have been appropriate in some way for the inclusion of analogue components. Indeed, the existing studies that have combined Rachman et al.'s (1996) procedure with analogue interventions have overall reported mixed success for distress reduction (e.g. Marcks & Woods, 2007). In the next series of studies, we explored both of these issues with a modified distress induction procedure and an alternative, but related, set of analogue therapeutic interventions.

Chapter 4
Experiments 6-8

Experiments 6-8

An Empirical Investigation of Self as Context and Mindfulness

Mindfulness exercises have received increasing attention in behavioural psychology because of their positive implications for clinical (e.g. Speca, Carlson, Goodey, & Angen, 2000) and non-clinical populations (e.g. Jain et al., 2007). Mindfulness has been defined as a state of *"awareness that emerges through paying attention on purpose, in the present moment and nonjudgmentally"* (Kabat-Zinn, 2004, p. 4). As a result, mindfulness techniques aim to facilitate a sense of present moment acceptance and awareness, such that a potentially problematic pattern of thinking is disrupted and subsequently allowed little intrinsic power over behaviour. Numerous studies have provided empirical support for the beneficial effects of these techniques when presented within specific therapeutic packages (e.g. MBSR).

Mindfulness-Based Stress Reduction (MBSR)

A critical feature of training in MBSR is its intensity (e.g. sessions may last around eight hours). A target skill for initial training comprises the body scan, in which attention is directed sequentially to areas of the body through careful observation. In appearance and aim, this feature is almost identical to Vipassana Meditation. Specifically, participants are instructed to maintain a wakeful posture and direct their attention to the sensations of breathing. Hatha Yoga postures are then used to teach mindfulness of other bodily sensations during gentle movement and stretching. For all mindfulness exercises, participants are instructed to focus attention on the target of observation (e.g. breathing or walking) and to be aware of this in each moment. When emotions, sensations, or cognitions arise, they are to be observed non-judgementally (Baer, 2003). If the mind wanders, the content is noted briefly and participants are encouraged to gently and non-judgementally return their attention to the

target sensations and the present moment. In short, a central message is to notice thoughts and feelings without becoming absorbed in their content (Kabat-Zinn, 1982). At a broader level, the target 'realisation' is that sensations, thoughts and emotions fluctuate across time.

Some empirical evidence attests to the utility of MBSR in a range of health contexts. These include: enhanced self-regulation of chronic pain (Kabat-Zinn, Lipworth, & Burney, 1985); psoriasis management (Kabat-Zinn et al., 1998); stress reduction in cancer (Speca et al., 2000); and fibromyalgia (Kaplan, Goldenberg, & Galvin-Nadeau, 1993). Outcomes also show reductions in: stress (Miller, Fletcher, & Kabat-Zinn, 1995); anxiety (Shapiro, Schwartz, & Bonner, 1998); depression (Teasdale et al., 2000); and binge eating (Kristeller & Hallett, 1999). Data also support improvements in psychological well-being and quality of life issues (Nyklícek & Kuijpers, 2008).

In spite of a wealth of empirical evidence in support of MBSR techniques (and mindfulness in general), Bishop et al. (2004) have argued that the core concept of mindfulness has not been fully articulated. Specifically, they have argued that mindfulness is fundamentally a twin-component process of gaining insight into the nature of one's mind and adopting a de-centred perspective on its content in a manner that facilitates the experiencing of content as subjective and transient. The first component involves the self-regulation of attention on immediate experience that allows for instant recognition of physical and psychological events. The second component thereafter involves adopting an orientation of curiosity, openness and acceptance towards one's experiences in the present moment.

Mindfulness in ACT

Behavioural researchers have also attempted to identify the core processes that underpin mindfulness. For example, Baer et al. (2004) have suggested that mindfulness comprises of four key behavioural components: observing; describing; acting with awareness;

and accepting without judgement. In a similar vein, Hayes et al. (2006) have proposed that mindfulness is comprised of four of the six hexaflex processes, namely contact with the present moment, self as context, acceptance and defusion. As a result, it is not surprising that ACT clinicians have begun to place increasing emphasis on the use of mindfulness-based techniques in ACT protocols.

The recent move of ACT clinicians towards mindfulness components has been driven more by clinical than scientific concerns. That is, there is little or no published evidence to indicate that traditional ACT outcomes are enhanced by the inclusion of mindfulness techniques. What ACT clinicians often argue, however, is that there is considerable overlap between mindfulness and ACT techniques because the core underlying processes are essentially the same. Some authors have postulated a direct link between mindfulness and contact with the present moment in particular. For example, Fletcher and Hayes (2005) defined contact with the present moment as shifting attention to what is happening in the here-and-now and *"contacting both internal stimuli, such as bodily sensations, thoughts and feelings and external stimuli, such as sounds, sights, smells and touch"* (pp. 320-21).

As outlined in Experiment 5, there are no exercises in ACT that are formally created to target contact with the present moment. And as such, the exercise in Experiment 5 used to target this component of the hexaflex was a mindfulness exercise adapted from Kabat-Zinn (1994). For this reason, we decided to take the contact with the present moment exercise from Experiment 5 and rename it as mindfulness for Experiments 6-8 in order to ensure that in the current series of studies we remained consistent with practices that represent mindfulness fairly.

As a starting point towards determining whether mindfulness and existing hexaflex concepts overlap at the level of basic process, the current research began by exploring the relative utility of self as context exercises with a matched mindfulness exercise. Consider the

potential differences between the two. Self as context exercises (e.g. the Observer Exercise) are designed to move clients away from self as content and towards self as context, thereby reducing the hold that psychological content exerts over a client's sense of self. In a similar manner, mindfulness exercises (e.g. the Body Scan) are designed to directly increase awareness of physical sensations with the ultimate aim of separating these from one's sense of self. In short, mindfulness explicitly promotes awareness of one's content, while self as context promotes a broader separation of content from the self. Given these differences, one might make a number of propositions. 1. Mindfulness might be more effective initially than self as context because the latter can only achieve the target cognitive distancing if participants first employ awareness with regard to their to-be-distanced content. Or 2. Alternatively, self as context might be more effective because distancing from content is likely to be a more effective place from which to operate than simply being aware of content. These issues were central to the following experiments conducted in the current chapter.

Experiments 6-8. The current set of studies (Experiments 6-8) comprise of empirical analyses of the role of mindfulness in ACT interventions using an experimental distress induction procedure. If, as suggested by the hexaflex, self as context is pivotal in ACT outcomes, we reasoned that a self as context intervention (which emphasised a distinction between the individual and his/her content) would likely demonstrate larger reductions in distress relative to a mindfulness intervention (which merely instructed the individual to be aware of his/her on-going psychological content). In simple terms, Experiment 6 asked if an ACT intervention specifically targeting self as context would successfully reduce experimentally induced distress and if so, would these effects be different to a mindfulness intervention. Furthermore, Experiment 7 separated mindfulness into two interventions targeting either physical or verbal awareness and investigated their relative utility. Finally, Experiment 8 investigated further the role of mindfulness in distress reduction with regards to

the sequencing of its various components. A new and more ACT-related experimental preparation was employed in this chapter as a means of distress induction. This simply asked participants to present a self-criticism which caused them distress (Masuda, Hayes, Sackett, & Twohig, 2004). The use of this alternative procedure was in part designed to rectify the high drop-out rates (approx 10% of overall participants) of the previous experiments (primarily due to the large numbers of participants with previous experience of motor accidents). However, it also served to provide a distress induction procedure that might yield better to brief ACT-based analogue interventions given the poor outcomes recorded in Experiments 2-5.

Experiment 6

An Empirical Investigation of Self as Context vs. Mindfulness

The aim of Experiment 6 was to investigate potential differences between self as context and mindfulness techniques. We did not make any specific predictions about the outcomes, but were concerned with the possibility of differentiated outcomes based on the fact that self as context techniques encourage a focus on *psychological* events, (such as thoughts), while mindfulness techniques encourage a focus on *somatic* events (i.e. the body). Hence, comparing the two would perhaps allow us to determine whether it is the self-focus per se or the target of this focus that facilitates distress reduction. A third condition acted as a control condition and included a self-focus exercise which was also designed to determine whether any effects recorded for the interventions were attributed to *the act of self-focusing alone* and not specifically to focusing on thoughts or physical sensations. A new distress induction procedure called the self-criticism task was employed to avoid the high drop-out rates of previous experiments (primarily due to the large numbers of participants with previous experience of motor accidents) and to provide a distress induction procedure that might yield better to brief analogue interventions.

Method

Participants

Thirty-four volunteers (27 males and 7 females) participated in Experiment 6. All were aged between 19 and 25 years old and were undergraduates at NUIM. Any participant who reported significant mental health issues (e.g. anxiety) that may be adversely affected by participation was excluded (4 were removed on this basis). Given the new distress induction task, there was no longer a need to determine in participants could drive or had any previous

experiences with car accidents. Therefore, 30 individuals participated fully in the research (12 males and 18 females, mean age: 22 years, 1 month). Each participant was assigned to one of three experimental conditions: mindfulness (N = 10), self as context (N = 10) or self-focus (N = 10).

Materials and Setting

Experiment 6 included some materials from the previous studies: a desk; two chairs; a pen; a sheet of blank paper; a Consent Form; a modified version of the ESQ for exclusion purposes (the adaptation did not include questions about road accidents because a different distress induction procedure was employed here; see Appendix 8); the AAQ; the same VASs; two copies of a new RQ (because of the new distress induction task; see Appendix 9); and a Debriefing Form. The PHLMS was omitted because it had not yielded any useful findings and the moral wrongness question was removed from the RQ because this question did not apply to the new distress induction procedure. Some additional materials were also employed. These included a tape player and a Demographic Questionnaire (DQ; see Appendix 10) which comprised of eight questions that related to age, occupation, etc. (e.g. "How old are you?" and "How many siblings do you have?").

Ethical Issues

Although the current distress induction procedure differed from that used in Experiments 1- 5, the same ethical guidelines were upheld for the current experiment (see pp. 52-53) and the same consent form was employed (see Appendix 1). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The experimental sequence employed in Experiment 6 was identical to the previous studies. For convenience, Figure 20 illustrates this sequence. Again, the sequence involved: pre-experimental measures (Stage 1); baseline VAS ratings (Stage 2); the (new) distress induction procedure (Stage 3); post-induction VAS ratings and the RQ (Stage 4); one of three possible exercises (Stage 5); post-intervention distress induction procedure (Stage 6); and post-intervention VAS ratings and the RQ (Stage 7). It is important to note that the word "intervention" is no longer used to refer to the manipulations in Stage 5 because only two of the conditions (mindfulness and self as context) involved interventions, while the self-focus condition was employed for the purposes of experimental control.

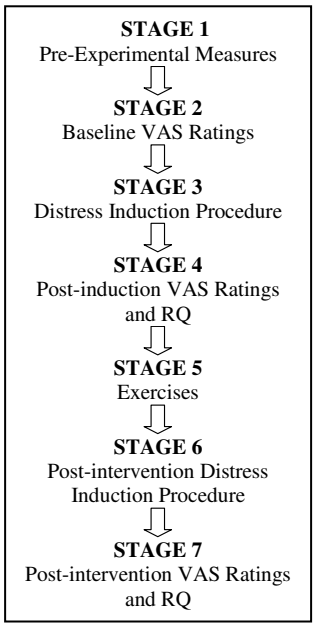


Figure 20. An overview of the experimental sequence in Experiments 6-8.

Stage 2: Distress induction procedure (self-criticism). There was considerable overlap in structure between Rachman et al. (1996)'s distress induction procedure involving the car accident used in the previous experiments and the new procedure employed here. That is, the single-sentence about the accident was simply replaced by a single-sentence involving what participants disliked about themselves (i.e. a self-criticism). Indeed, the presentation of the target sentence was identical in that participants once again wrote it down. This was then read aloud by the Experimenter and thereafter repeated aloud by the participant. To illustrate the new procedure, consider the following example. If a participant called Ann disliked her figure, she might write "Ann is fat". All participants were presented with the following instructions:

> Before we begin, I want to explain to you that some of what I will ask you to do in this experiment could be difficult for you. I am not going to ask you to disclose any personal information, but this task could present you with a considerable emotional challenge. At this point, I am not able to tell you what that will be because that would defeat the purpose, but I do want to assure you that you will not be made to do anything you do not want to do. If, at any point, you feel that you have reached your level of discomfort and want to stop what we are doing, please let me know and we will stop immediately. Is that ok with you?
>
> *Participant responds*
>
> Ok, so what I want you to do is try to think of one negative thing about yourself. I know this is difficult to do, but I want you to try as hard as you can to think of the one thing you really hate about yourself. When you have this in mind, I want you to write it down on that page in front of you. However, I want you to write it from someone else's point of view or in someone else's words. For example, I am afraid that I am not smart enough so I might write down "Mairead is not smart enough to be doing a PhD". Do you understand what I am asking you to do? *Participant answers*. OK, now in case you have any worries at this stage, I want to assure you that as soon as this experiment is over, I will be dumping that page in front of you. So you have no need to worry about anything you write on it, is that ok?
>
> *Participant answers.*
>
> OK, so when you're ready go ahead and write it down there. *Participant writes the sentence down.* Ok thank you for doing that. I appreciate that it is probably difficult for you to do. Now for the next part I will call out the sentence and I want you to repeat it. Now remember, if you want to stop at any stage, you are completely free to do so. If you decide that you don't want to say the sentence, then that's OK. Just let me know and we will stop what we are doing and move onto the next stage of the experiment. Is that ok with you? Do you have any questions at this point? Ok let's begin.
>
> *Experimenter says the sentence aloud.*
>
> *Participant repeats the sentence aloud.*

Stage 3: Interventions/Exercise. Similar to the previous studies, two of the three conditions (self as context and mindfulness) involved a brief therapeutic strategy. Indeed, the self as context intervention was largely identical to that employed in Experiments 2-5 (the only changes involved minor modifications in order to co-ordinate better with the new distress induction procedure). The mindfulness intervention was an entirely new addition to the research programme, but was similar in format to self as context. In contrast, the self-focus condition was employed as an experimental control.

Self as context. The self as context intervention was largely identical to that employed in Experiments 2-5 (see pp. 70-71).

Mindfulness. The mindfulness intervention comprised a modified version of a very standard technique employed in mindfulness-based therapies, known as the Body Scan which is explicitly designed to promote awareness of bodily sensations. Participants in this condition were presented with the following instructions:

> I understand that the previous self-criticism may have generated some unpleasant thoughts and feelings for you. The aim of the next part of the experiment is to teach you a coping strategy to deal with any negative sensations that might have risen during the last part of the experiment.
>
> Try to relax yourself in the chair and get comfortable. When you're ready I want you to close your eyes and listen to my voice. If you find your mind wandering, just gently come back to the sound of my voice.
>
> When very painful thoughts come to mind they are often accompanied by unpleasant sensations. For example, your chest might tighten or you might feel tense. This package of painful thoughts and unpleasant sensations often feels like it's too much to deal with. And when we have that very thought "this is just too much", our level of discomfort goes even higher. Then we feel like we are in a position where we really don't know what to do *(pause).* Powerful feelings such as anxiety or sadness can often be expressed as effects in the body. For example, tightness in the chest may signal the presence of strong feelings like in the last part of the experiment. As a result, some believe that learning about the body will be helpful in learning how better to deal with feelings and emotions.
>
> For the next part of the experiment, try to focus your attention on your breath and try to feel the rising and falling of our belly with each in-breath and out-breath you take. Take a few moments to feel your body as a whole, from head to toe. For example, try to feel the sensation of your back touching the chair or the feeling of your feet on the ground. For now, try to bring your attention to the toes of your left foot. As you direct your attention to them, see if you can direct, or channel, your breathing to them as well, so that it feels as if you are breathing into your toes and out from your toes. It may take a while for you to get the hang of this. It may help to just imagine your breath travelling down the body from your nose into the lungs and then continuing through the abdomen and down the left leg all the way to the toes…. And then back again and out through your nose. Allow

> yourself to feel any and all sensations from your toes, perhaps distinguishing between them and watching the flux of sensations in this region. If you don't feel anything at the moment, that is fine too. Just allow yourself to feel "not feeling anything". When you are ready to leave the toes and move on, take a deeper, more intentional breath in all the way down to the toes and on the out-breath, allow them to dissolve in your mind's eye. Stay with your breathing for a few breaths and then move on in turn to the sole of your foot…the heel....the top of our foot…..and then the ankle….all the time continuing to breathe into and out of the foot, continuing to breathe into and out from each region as you observe the sensations that you are experiencing and then letting go of it and moving on. If your attention wanders off, it is important that you bring your mind back to the breath and to the region you are focusing on.
>
> In this way continue to move slowly up your left leg and through the rest of your body as you maintain the focus on your breath and on the feeling of the particular regions as you come to them, breathe with them and let go of them. Go to the stomach…all the way up to the shoulders…down to your elbows…and all the way to your fingertips. In the same way, start at the base of your neck…move up to your chin…your nose… and all the way to your forehead. When you have reached the top of your head, let me know. However, as you move through the body try to remember the basic instructions of this exercise; that is to bring awareness to a particular region of the body, to hold it in awareness for a short time and finally to release and "let go" of that region before moving your attention to the next region.

Self-focus. The self-focus exercise acted as a control condition. Because elements of both the self as context and mindfulness interventions required participants to focus on aspects of themselves and specifically to focus on thoughts (self as context) or the body (mindfulness), the self-focus condition was designed to determine whether any effects recorded for the interventions could be attributed to *the act of self-focusing alone* and not specifically to focusing on thoughts or physical sensations. In other words, would the self-focus condition without any intervention yield similar outcomes to the two other interventions?

The self-focus condition primarily involved presenting participants with a series of eight questions about themselves (referred to as the Demographic Questionnaire, DQ). Participant responses to each question were spoken aloud to the Experimenter, while being audio-taped and participants then listened to their own voice as the audio-recording was replayed. These participants were instructed as follows:

> Ok, before we go onto the next part of the experiment I was hoping you wouldn't mind if I recorded your demographic information. I have a list of questions here that I'd like you to answer into this voice recorder.
>
> *Participants were handed the DQ and spoke each of the eight answers aloud.*

Thank you. Now I am going to play back the recording of your answers and I would like you to focus as much as possible on the sound of your own voice and hearing your own information.

Participants listen to the recording.

Results

AAQ Data

Participants in the three conditions did not differ significantly on pre-experimental avoidance as measured by the AAQ (see Table 11). The means were modest (i.e. 18.8-20.8) for all three conditions (i.e. just above the normal range of 18). However, a one-way ANOVA revealed a non-significant difference across conditions (p = .74).

Table 11
Means, Standard Deviations and Significance Value by Condition on the AAQ in Experiment 6

	Self as Context ***M* (*SD*)**	**Mindfulness** ***M* (*SD*)**	**Self-Focus** ***M* (*SD*)**	***p* value**
AAQ	20.8 (6.86)	20.4 (6.24)	18.8 (4.76)	.74

M = Mean; *SD* = Standard Deviation; *p* values = Statistical Significance

Distress Ratings

Once again, the data from the three types of distress ratings were analysed separately and are presented below.

Discomfort. All conditions recorded similarly low levels of discomfort (< 14/100) at baseline, which increased strongly after the distress induction procedure (mindfulness: +29.68; self as context: +17.87; self-focus: +23.14; see Figure 21). Thereafter, all conditions showed a decrease in discomfort at post-intervention, but this was largest in the mindfulness

condition (-23.99). In contrast, the decrease was moderate in self as context (-12.1) and small in self-focus (-6.76).

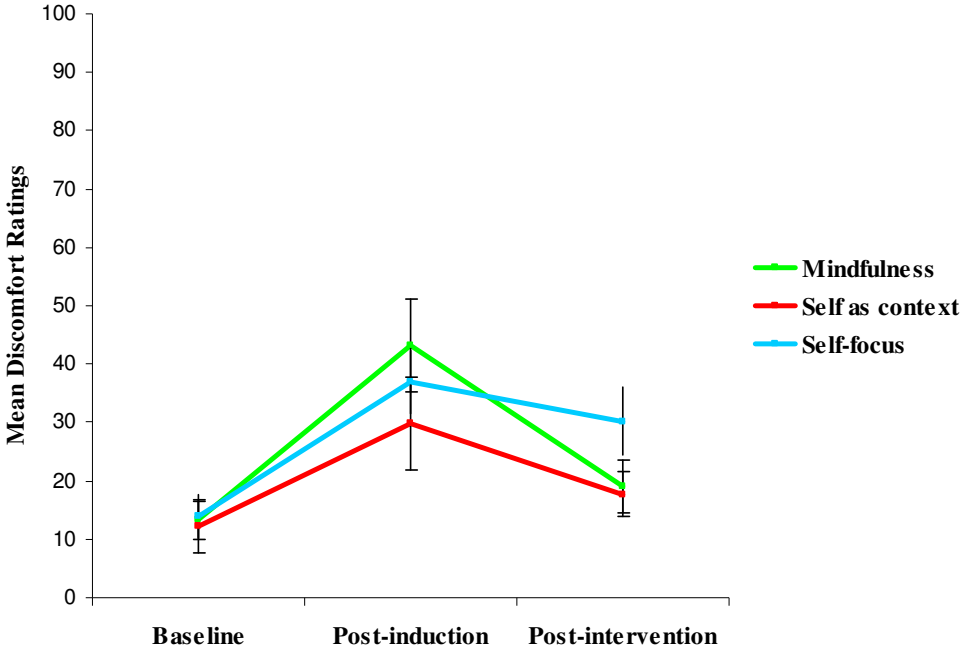


Figure 21. Mean discomfort ratings for each condition across time in Experiment 6.

A mixed between within 3x3 ANOVA revealed a significant main effect for time [Wilks Lambda = .37, F (2, 26) = 21.83, p = .00, partial eta squared = .63] that accounted for a large amount of the variance (63%), but not for condition [F (2, 27) = .77, p = .47, partial eta squared = .05]. The interaction effect was also non-significant [Wilks Lambda = .83, F (4, 52) = 1.31, p = .33, partial eta squared = .09]. Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .001).

Anxiety. All three conditions recorded similarly low anxiety (< 19/100) at baseline, which increased strongly at post-induction (mindfulness: +18.16; self as context: +16.25; self-focus: +17.29; see Figure 22). At post-intervention, mindfulness and self as context

resulted in large decreases in anxiety (mindfulness: -15.79; self as context: -16.18), while there was virtually no change recorded in the self-focus condition (-.72).

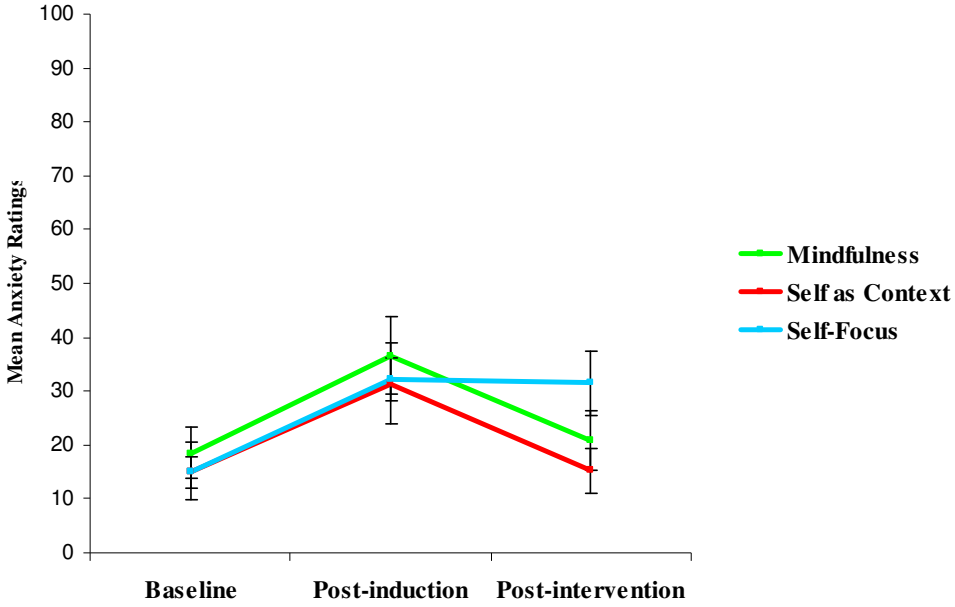


Figure 22. Mean anxiety ratings for each condition across time in Experiment 6.

A mixed between within 3x3 ANOVA revealed a significant main effect for time [Wilks Lambda = .53, F (2, 26) = 11.45, p = .000, partial eta squared = .47] that accounted for a substantial amount of the variance (47%), but not for condition [F (2, 27) = .53, p = .59, partial eta squared = .04]. The interaction effect was also non-significant [Wilks Lambda = .84, F (4, 52) = 1.17, p = .34, partial eta squared = .08]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .00) and a significant reduction from post-induction to post-intervention (p = .009).

Stress. All conditions recorded similarly moderate stress (<29/100) at baseline which increased modestly at post-induction (mindfulness: +7.67; self as context: +7.87; self-focus: +9.08; see Figure 23). Thereafter, all conditions showed a decrease in stress at post-

intervention, but this was much larger in the mindfulness (-16.68) and self as context (-13.86) conditions, relative to self-focus (-2.75).

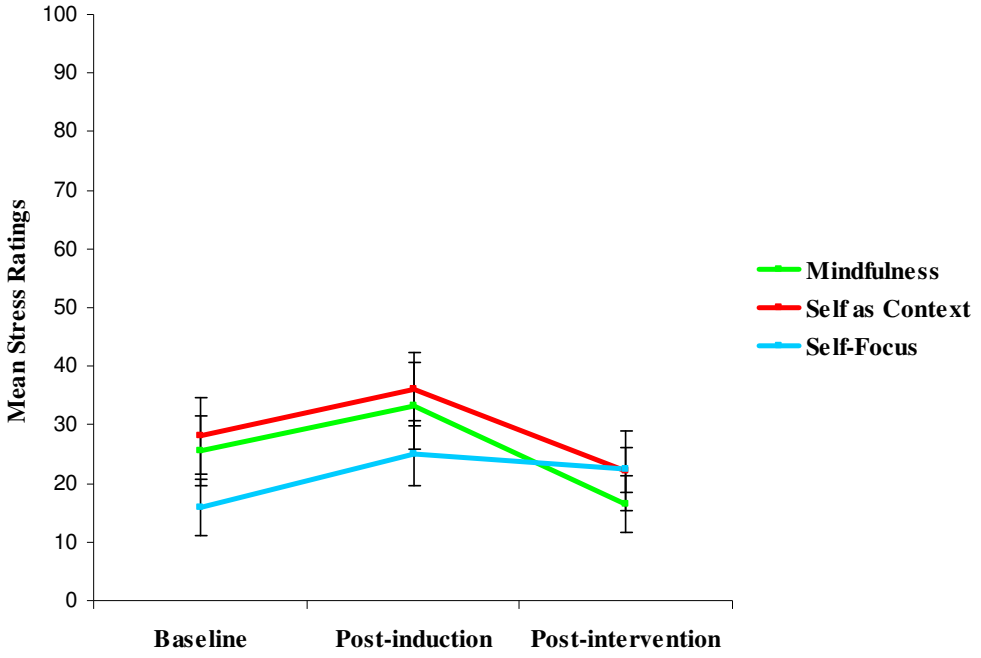


Figure 23. Mean stress ratings for each condition across time in Experiment 6.

A mixed between within 3x3 ANOVA revealed a significant main effect for time [Wilks Lambda = .73, F (2, 26) = 4.81, p = .02, partial eta squared = .27] that accounted for a medium amount of the variance (27%), but not for condition [F (2, 27) = .63, p = .54, partial eta squared = .04]. The interaction effect was also non-significant [Wilks Lambda = .84, F (4, 52) = 1.19, p = .33, partial eta squared = .084]. Two dependent t-tests showed a significant increase in stress from baseline to post-induction (p = .02) and a significant reduction from post-induction to post-intervention (p = .005).

RQ Results

The mean ratings on each of the five reactions to the distress induction at Stages 4 and 7 are presented separately below. Table 12 presents the data from each of the five reactions by time point and condition.

Table 12
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 6

Reactions Questionnaire	Time	Self as Context *M* (*SD*)	Mindfulness *M* (*SD*)	Self-focus *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the sentence	Post-induction	76.3 (23.86)	59.83 (21.64	62.6 (11.17)
	Post-intervention	77.6 (24.94)	48.55 (27.15)	61.5 (22.85)
Please rate how **believable** the sentence was to you	Post-induction	74.7 (17.05)	66.8 (23.74)	75.6 (18.45)
	Post-intervention	66.9 (23)	52.5 (27.90)	71 (20.74)
Please rate how **vivid** your thoughts and images were of the sentence	Post-induction	60.1 (36.53)	59.9 (13.17)	63.5 (22.3)
	Post-intervention	60.4 (23.44)	39.7 (19.36)	61.7 (24.63)
Please rate how much **guilt** you feel right now	Post-induction	33.83 (26.41)	39.4 (25.08)	28.6 (32.89)
	Post-intervention	25.6 (25.72)	21.55 (19.77)	33.9 (31.21)
Please rate how much you tried to **distract** from the sentence	Post-induction	26.83 (20.31)	36.9 (16.43)	25.6 (17.71)
	Post-intervention	32.8 (26.36)	28.33 (24.39)	22.9 (22.51)

At post-induction, believability, vividness and guilt were similar for all three conditions. In contrast, self as context was higher than mindfulness and self focus in willingness, while mindfulness was higher in distraction than the other two conditions. A series of one-way ANOVAs revealed that none of these differences were significant (all ps > .11). At post-intervention willingness decreased in mindfulness, while self-focus and self as context showed little change. Believability decreased in all three conditions, with the biggest decrease in mindfulness. Vividness remained stable for self as context and self-focus

while there was a strong decrease for mindfulness. Distraction decreased for mindfulness and self-focus but increased for self as context. Guilt decreased in self as context and mindfulness (although it was moderately bigger in the latter), but increased marginally in self-focus. A series of a 2x2 mixed between within ANOVAs revealed a significant main effect for condition in willingness [F (2, 27) = 4.43, p = .022, partial eta squared = .25] that represented a medium amount of the variance (25%). In addition, for guilt, there was a significant effect for time [Wilks Lambda = .82, F (1, 27) = 5.77, p = .024, partial eta squared = .18] that also represented a medium amount of the variance (18%) and the interaction [Wilks Lambda = .71, F (2, 27) = 5.42, p = .011, partial eta squared = .29] that accounted for a medium amount of the variance (29%) (all other ps > .08).

Results Summary

The data from the screening measures indicated that the three conditions did not differ pre-experimentally on propensities towards avoidance. At baseline, all conditions were low in discomfort, anxiety and stress and these increased for all conditions at post-induction. In general all conditions reduced distress at post-intervention. Results from the RQ indicated some differences among conditions. Most notably, mindfulness resulted in the largest decrease in willingness, believability, vividness, guilt and distraction, while self-focus resulted in the least change across all five questions.

Discussion

The results demonstrated a significant increase in all three distress ratings across all conditions, thus suggesting that the new experimental task is a viable means of inducing distress in this non-clinical sample. Furthermore, the results showed little differences among

conditions in their utility to reduce this distress. However, the mindfulness technique did show some superiority in terms of reducing vividness, believability and distraction.

The parity between, and minor superiority of mindfulness and self as context raised further questions about why the outcomes were as recorded. At the very least, they suggested that there is perhaps more to mindfulness than awareness. For example, while the Body Scan explicitly encourages participants to focus on physical sensations, perhaps this initial focus readily facilitates subsequent or parallel awareness of psychological content. In short, maybe awareness of your psychological content in turn promotes cognitive distance between you and this content (similar to self as context). Experiment 7 attempted to address this issue by parsing out a physical vs. psychological or verbal focus within mindfulness techniques.

Experiment 7

Comparing Physical vs. Verbal Mindfulness Techniques

The MBSR programme developed by Kabat-Zinn (2004) specifically employs techniques to foster acceptance and awareness of physical sensations and presumably to permit generalisation to verbal content. The latter has been targeted more directly by cognitive researchers such as in Mindfulness Based Cognitive Therapy (MBCT, Segal, Williams & Teasdale, 2002). That is, this approach has incorporated mindfulness techniques in order to change an individual's relationship to his/her thoughts, such that the focus is on noticing the thought and letting it go, as opposed to focusing on its specific content. In this way, attachment to (and rumination over) certain thoughts is reduced and a more experiential sense of thinking and behaving is encouraged.

In general, the term mindfulness operates as an umbrella term within therapeutic traditions for any technique that promotes awareness and presumed acceptance of a present moment experience. While awareness of physical sensation and of thoughts are assumed to share the same underlying processes (awareness and acceptance), the object of an individual's focus is different. However, no research to date has tried to decipher which object of awareness (physical or verbal) is more beneficial. The goal of Experiment 7 was to systematically compare the utility of a physical vs. verbal mindfulness technique in a non-clinical sample presented with experimentally induced distress induction.

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Method

Participants

Thirty volunteers (9 males and 21 females) participated in Experiment 7. All were aged between 17 and 31 years old and were undergraduates at NUIM. The same exclusion criteria as the previous experiment applied (4 participants were excluded on this basis). This yielded a final sample of 26 participants (5 males and 21 females, mean age = 24 years, 7 months) assigned randomly across two experimental conditions: physical mindfulness (N = 13) and verbal mindfulness (N = 13).

Setting and Materials

All aspects of the setting and materials were identical to Experiment 6.

Ethical Issues

All ethical issues pertaining to previous experiments applied to here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiment 6 (see Figure 20, p.119) and involved: pre-experimental measures (Stage 1); baseline VAS ratings (Stage 2); the distress induction procedure (Stage 3); post-induction VAS ratings and the RQ (Stage 4); one of two mindfulness interventions (Stage 5); a post-intervention distress induction procedure (Stage 6); and post-intervention VAS ratings and the RQ (Stage 7).

Stage 5: Mindfulness Interventions. Stage 5 systematically compared a physical mindfulness intervention with a verbal mindfulness intervention in order to determine whether one would yield a superior outcome in the current context.

Physical mindfulness. The physical mindfulness intervention was explicitly designed to promote awareness of bodily sensations. Hence, the Body Scan from Experiment 6 was employed again (although what was then referred to as 'mindfulness' is now more specifically denoted as 'physical mindfulness'). Participants in the physical mindfulness condition received identical instructions to the mindfulness condition from Experiment 6 (see pp. 121-122).

Verbal mindfulness. Participants in this condition were presented with a modified version of a mindfulness technique commonly used in MBCT. The verbal mindfulness intervention was explicitly designed to promote awareness of thoughts and memories. Participants in this condition were instructed as follows:

> For this part of the experiment we are going to do an exercise to help you get in touch with the thoughts going through your head in this very instance. If you can, try to relax yourself in the chair. When you're ready, close your eyes and listen to the sound of my voice. If you feel your mind wandering, gently come back to the sound of my voice. Keeping your eyes closed, I want you to become aware of the thoughts and images that are passing through your mind at this very moment. If you can, I want you to focus your attention on one particular thought (*pause*). Isolate that thought in your mind (*pause*). Now just watch as the thought pops into your mind and just as importantly, watch the thought as it leaves your mind. Once you acknowledge that you have had the thought, it is important that you try to let go of this thought again.
>
> Try as much as you can to just watch the thought as it comes in and leaves, without feeling that you have to follow it. Try to view your thought as a mental event that is always changing, rather than as a fact that has no room to change. It may be the case that this thought usually occurs for you with other feelings or sensations and as a result it is tempting to think of it as being true. But it is still up to you to decide whether it is true and how you want to deal with it.
>
> Now, do the exact same thing with another thought you are having at this very moment. Try as much as you can to isolate the thought in your mind (*pause*). Watch the thought as it comes into your mind, notice it for a moment or two and then let it go again. Try this with all of your thoughts. As one thought comes up, simply observe it and let it go again. Do the same with the next thought. By becoming aware, over and over again, of the thoughts and images that pass through our minds and letting go of them as we return our attention to the moment, it is possible to get some distance and perspective on them. This can allow us to see that there may be other ways to think about situations, freeing us from the tyranny of the old thought patterns that automatically "pop" into "mind".
>
> You could allow yourself to think any and all of your thoughts at this moment, perhaps

distinguishing between them and watching them continuously coming and going as they pass through your mind. The important thing to remember is not to hang onto any one thought at any time. Instead, as soon as the thought is acknowledged and observed, try to let it go again with as little judgement as possible. Even a thought like "this is a foolish waste of time" should not be judged, but instead watched as it comes into your mind and passes away again.

Results

In line with the previous experiments, three investigations were central to Experiment 7. The first examined the effect of the distress induction procedure on discomfort, anxiety and stress. The second investigated the difference between the physical and verbal mindfulness interventions in terms of reductions in the dependent measures. The third explored potential differences between the conditions with regard to participants' reactions to the distress induction procedure.

AAQ Data

The pre-experimental means for avoidance on the AAQ are presented in Table 13. The means were moderate (i.e. 15.62-16.08) for both conditions, thus within the normal range (i.e. < 18). An independent t-test confirmed that the conditions did not differ significantly in this regard (p = .1).

Table 13
Means, Standard Deviations and Significance Value by Condition on the AAQ in Experiment 7

	Physical ***M* (*SD*)**	**Verbal** ***M* (*SD*)**	***p* value**
AAQ	15.62 (9.65)	16.08 (6. 79)	.1

M = Mean; *SD* = Standard Deviation; *p* value = Statistical Significance

Distress Ratings

The mean VAS ratings by condition recorded at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded similarly low discomfort (< 19/100) at baseline (see Figure 24) and showed moderate increases in discomfort after the distress induction (physical: +13.64 and verbal: +12.53). After exposure to the interventions, the physical condition reduced discomfort considerably (-20.42), while the verbal condition showed a more modest decrease (-7.29).

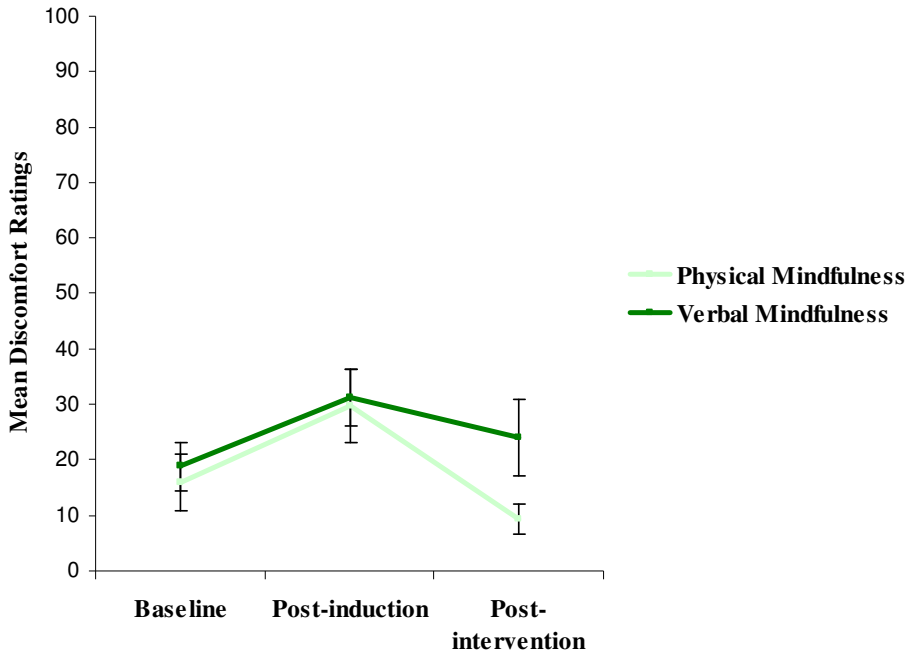

Figure 24. Mean discomfort ratings for each condition across time in Experiment 7.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .56, F (2, 23) = 9.01, p = .001, partial eta squared = .44] that accounted for a substantial amount of the variance (44%), but not for condition [F (1, 24) =1.25 p = .28, partial eta squared = .05]. The interaction effect was also non-significant [Wilks' Lambda = .92, F (2, 23) = .99, p = .39, partial eta squared = .08]. Two dependent t-

tests showed a significant increase in discomfort from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .009).

Anxiety. Both conditions recorded similarly low anxiety (< 14/100) at baseline, which increased similarly and modestly at post-induction (physical: +12.04 and verbal: 13.04; see Figure 25). Thereafter, both interventions appeared to result in modest decreases in anxiety (physical: -14.14 and verbal: -9.55).

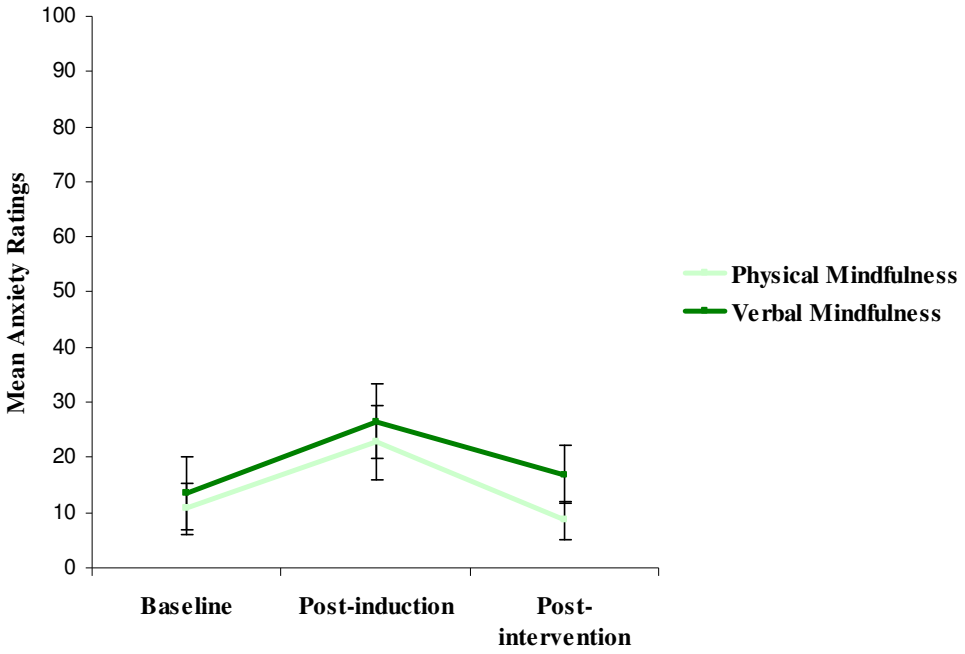

Figure 25. Mean anxiety ratings for each condition across time in Experiment 7.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .55, F (2, 23) = 9.5, p = .001, partial eta squared = .45] that accounted for a substantial amount of the variance (45%), but not for condition [F (1, 24) = .51, p = .48, partial eta squared = .02]. The interaction effect was also non-significant [Wilks' Lambda = .98, F (2, 23) = .29, p = .89, partial eta squared = .06]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .009).

Stress. Both conditions recorded similarly moderate levels of stress (< 28/100) at baseline, which increased only marginally after the distress induction (physical: +5.01 and verbal: +3.76; see Figure 26). After the intervention, the physical condition recorded a considerable reduction in stress (-21.74), while the verbal condition showed a more modest decrease (-11.64).

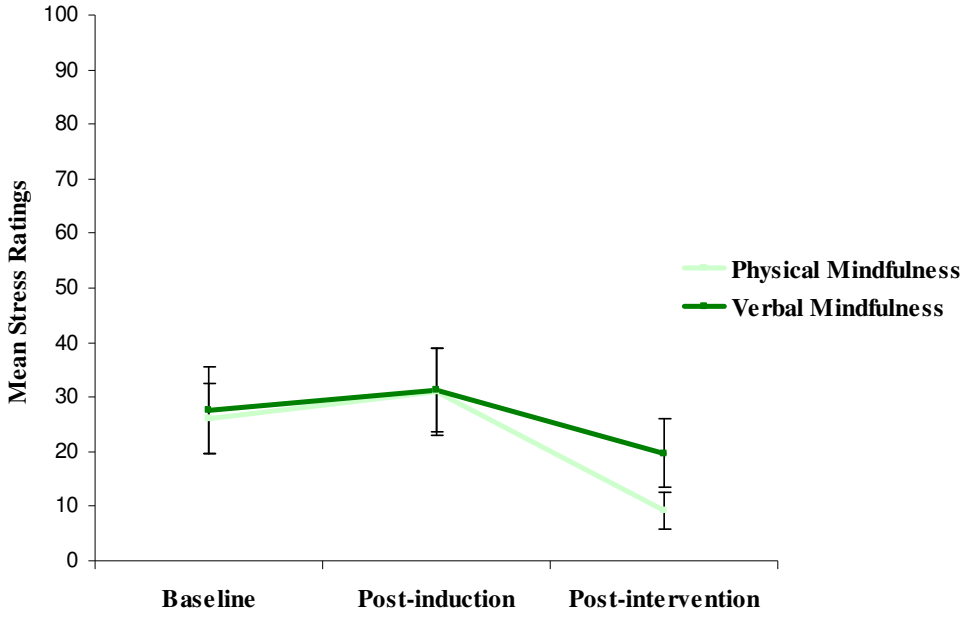

Figure 26. Mean stress ratings for each condition across time in Experiment 7.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .59, F (2, 23) = 8.13, p = .002, partial eta squared = .45] that accounted for a substantial amount of the variance (45%), but not for condition [F (1, 24) = .25, p = .65, partial eta squared = .01]. The interaction effect was also non-significant [Wilks' Lambda = .94, F (2, 23) = .79, p = .47, partial eta squared = .06]. Two dependent t-tests showed that the increase from baseline to post-induction was not significant (p = .12), while the decrease from post-induction to post-intervention was (p = .00).

RQ Results

The mean ratings on each of the five reactions to the distress induction at Stages 4 and 7 are presented separately below. Table 14 presents the data from each of the five reactions by time point and by condition.

Table 14
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 7.

Reactions Questionnaire	Time	Physical *M* (*SD*)	Verbal *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the sentence	Post-induction	56.02 (32.92)	62.21 (27.58)
	Post-intervention	52.5 (38.59)	63.17 (31.49)
Please rate how **believable** the sentence was to you	Post-induction	60.42 (22.19)	44.47 (35.27)
	Post-intervention	36.09 (26.09)	34.61 (32.43)
Please rate how **vivid** your thoughts and images are of the sentence	Post-induction	57.83 (29.36)	46.59 (27.27)
	Post-intervention	27.68 (26.23)	41.82 (27.75)
Please rate how much **guilt** you feel right now	Post-induction	43.38 (37.22)	32.26 (27.04)
	Post-intervention	14.86 (21.3)	28.36 (31.17)
Please rate how much you tried to **distract** from the sentence	Post-induction	24.73 (25.02)	45.96 (28.6)
	Post-intervention	12.31 (14.43)	23.46 (24.85)

At post-induction, participants in the physical condition were higher on all five of the reactions ratings. A series of independent t-tests revealed that this difference was not significant for willingness, believability, vividness or guilt (all ps > .19), but did approach significance for distraction ($p = .06$). At post-intervention both conditions decreased believability, vividness, guilt and distraction. Willingness decreased for physical mindfulness and increased for verbal mindfulness. A series of 2x2 mixed between ANOVAs revealed that

the effects for time was significant for believability [Wilks' Lambda = .57, F (1, 23) = 17.1, p = .00, partial eta squared = .43] and accounted for a substantial amount of the variance (43%), for vividness [Wilks' Lambda = .69, F (1, 24) = 10.78, p = .003, partial eta squared = .31] and accounted for a substantial amount of the variance (31%), for guilt [Wilks' Lambda = .77, F (1, 24) = 7.1, p = .014, partial eta squared = .23] and accounted for a medium amount of the variance (23%), and for distraction [Wilks' Lambda = .56, F (1, 24) = 18.57, p = .000, partial eta squared = .44] that accounted for a substantial amount of the variance (44%). The interaction effect was significant for vividness [Wilks' Lambda = .81, F (1, 24) = 5.7, p = .03, partial eta squared = .19] and represented 19% of the variance, and guilt [Wilks' Lambda = .85, F (1, 24) = 4.1, p = .05, partial eta squared = .15] which accounted for 15% of the variance, (all other ps > .09).

Results Summary

Similar to previous experiments, the conditions did not differ pre-experimentally on propensities towards avoidance. At baseline, both conditions scored similar on discomfort, anxiety and stress; however there was a significant increase on discomfort and anxiety for both conditions at post-induction. While stress increased for both conditions at this time point, this was not significant. There was a significant reduction in discomfort, anxiety and stress for both conditions at post-intervention. Results from the RQ demonstrated that both conditions decreased believability, vividness, guilt and distraction. Willingness decreased for physical mindfulness and increased for verbal mindfulness.

Discussion

The aim of the current study was to investigate whether the object of focus in mindfulness techniques influenced changes in distress. Specifically, we asked if awareness of

physical sensations was more or less beneficial than awareness of *thoughts*. Of course, this separation is rarely made in contemporary mindfulness therapies which generally combine both types of techniques with the assumption of a common outcome. However, Experiment 7 demonstrated that this common outcome may be questionable as the results indicated better outcomes (although not always significant) for physical mindfulness relative to verbal mindfulness.

Experiment 8

An Empirical Investigation of the Sequence of Mindfulness Components

While the physical and verbal mindfulness interventions from Experiment 7 appeared to be equally effective at reducing subjective distress, we considered the possibility that *combining* both elements would *enhance* the effects. As a result, in Experiment 8, we turned our attention to an investigation of the *sequencing* of mindfulness exercises. We employed the same design as before to explore the potential benefits of altering the sequence of the two previous mindfulness techniques. Specifically, the current study investigated whether a physical mindfulness technique followed by a verbal mindfulness technique (i.e. physical-verbal) would be more effective in decreasing distress than a sequence in which these two interventions were reversed (i.e. verbal-physical). We hypothesised that the sequence which presented the physical mindfulness exercise followed by the verbal mindfulness exercise would show the greatest reductions in distress this is the format employed in most mindfulness-based therapeutic packages (e.g. MBSR).

Method

Participants

Twenty eight volunteers (10 males and 18 females) participated in Experiment 8. All were aged between 20 and 34 years old and were undergraduates at NUIM. The same exclusion criteria as the previous experiment applied (4 participants were excluded on this basis). This yielded a final sample of 24 participants (7 males and 17 female, mean age = 30 years, 4 months) assigned randomly across two experimental conditions: physical-verbal mindfulness (N = 12) and verbal-physical mindfulness (N = 12). Please note that the hyphens indicate the sequencing of the two intervention components.

Setting and Materials

All aspects of the setting and materials were identical to Experiment 7.

Ethical Issues

All ethical issues pertaining to previous experiments applied here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiment 6 (see Figure 20, see p.119) and involved: pre-experimental measures (Stage 1); baseline VAS ratings (Stage 2); the distress induction procedure (Stage 3); post-induction VAS ratings and the RQ (Stage 4); one of two mindfulness interventions (Stage 5); the post-intervention distress induction procedure (Stage 6); and post-intervention VAS ratings and the RQ (Stage 7).

Stage 5: Mindfulness Interventions. Stage 5 involved the same two mindfulness intervention components (physical and verbal) as Experiment 7. The two conditions were now distinguishable only on the basis of the *sequencing* of these components. That is, half of the participants were exposed to physical mindfulness followed by verbal mindfulness (physical-verbal), while this sequence was reversed for the other half (i.e. verbal-physical). Both the physical and verbal interventions were identical to those used in Experiment 7 (see pp. 121-122 and pp. 132-133 respectively).

Results

In line with previous studies, three investigations were central to Experiment 8. The first examined the effect of the distress induction procedure on discomfort, anxiety and stress. The second investigated whether the sequence of mindfulness components played a role in reductions in the dependent measures. The third explored potential differences between conditions with regard to participants' reactions to the distress induction procedure.

AAQ Data

The pre-experimental outcomes for avoidance are presented in Table 15. The AAQ means were moderate (i.e. 14-18.1) for both conditions and within the normal range (i.e. < 18). An independent t-test confirmed that the conditions did not differ significantly in this regard (p = .09).

Table 15
Means, Standard Deviations and Significance Value by Condition on the AAQ in Experiment 8

	Physical-Verbal ***M*** **(*SD*)**	**Verbal-Physical** ***M*** **(*SD*)**	***p*** **value**
AAQ	18.1 (7.04)	14 (3.19)	.09

M = Mean; *SD* = Standard Deviation; *p* value = Statistical Significance

Distress Ratings

Once again, the mean VAS ratings by condition at baseline, post-induction and post-intervention are presented below.

Discomfort. Both conditions recorded very low discomfort (< 4/100) at baseline (see Figure 27) and showed a considerable increase after the distress induction (physical-verbal: +16.77; verbal-physical: +14.33). Thereafter, the physical-verbal condition reduced

discomfort considerably (-13.44), while verbal-physical showed only a marginal decrease (-5.18).

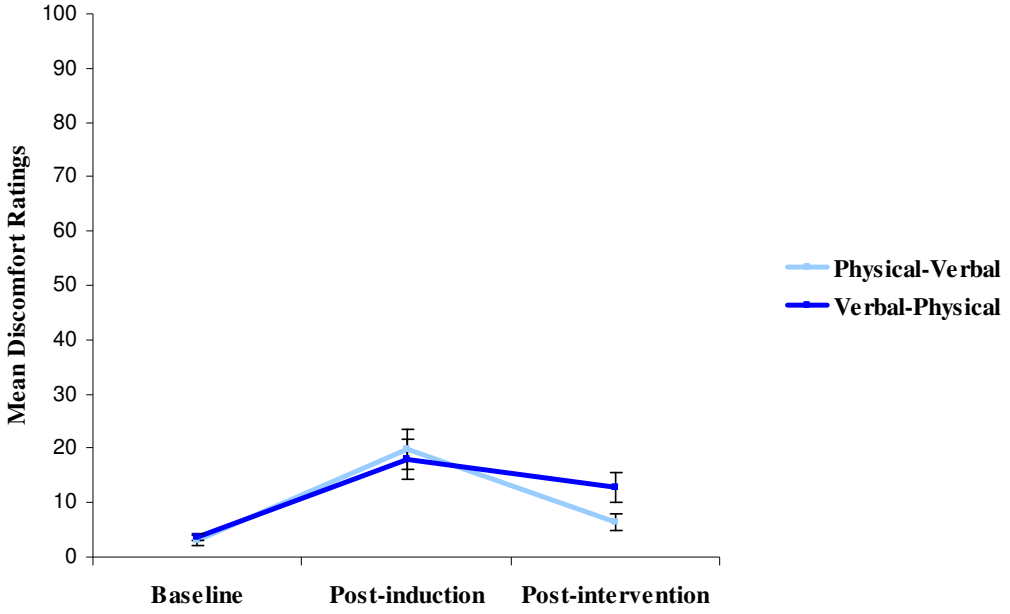

Figure 27. Mean discomfort ratings for each condition across time in Experiment 8.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .41, F (2, 21) = 15.43, p = .000, partial eta squared = .6] that accounted for a large amount of the variance (60%), but not for condition [F (1, 22) = .46 p = .51, partial eta squared = .02]. The interaction effect was also significant [Wilks' Lambda = .72, F (2, 21) = 4.14, p = .031, partial eta squared = .28] that accounted for a medium amount of the variance (28%). Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .000).

Anxiety. Both conditions recorded very low anxiety (< 4/100) at baseline and increased similarly at post-induction (physical-verbal: +13.65; verbal-physical: +14.4; see

Figure 28). Thereafter, the interventions resulted in a considerable decrease in anxiety for physical-verbal mindfulness (-11.41) and a smaller decrease for verbal-physical (-5.1).

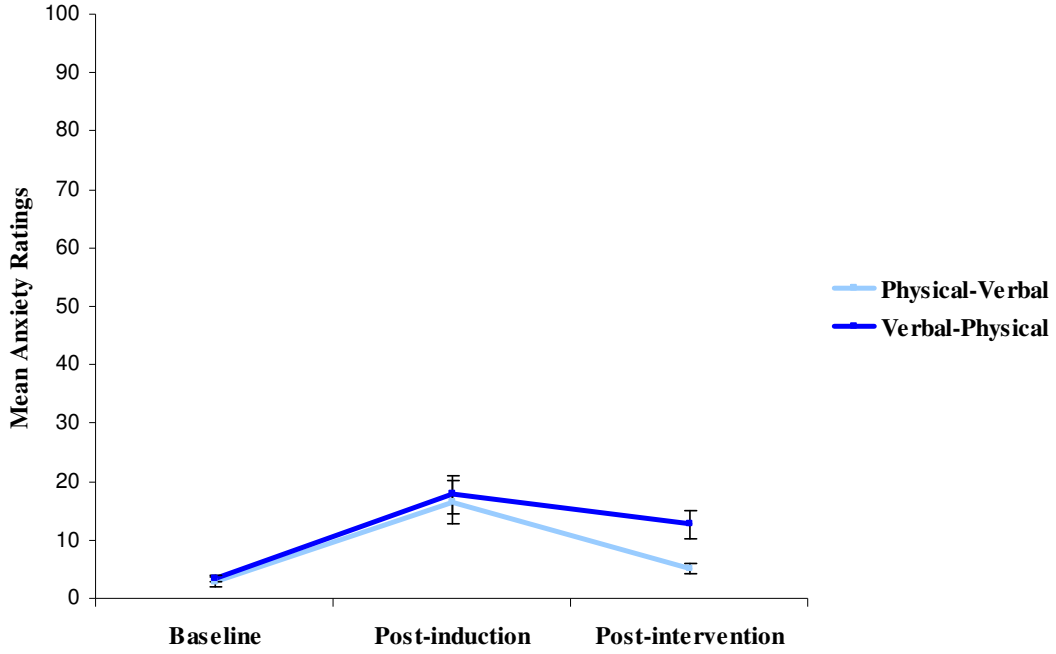

Figure 28. Mean anxiety ratings for each condition across time in Experiment 8.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .39, F (2, 21) = 5.12, p = .000, partial eta squared = .61] that accounted for a large amount of the variance (61%), but not for condition [F (1, 22) = 1.56, p = .23, partial eta squared = .07]. The interaction effect was also significant [Wilks' Lambda = .67, F (2, 21) = 5.12, p = .015, partial eta squared = .33] and represented a medium amount (33%) of the variance. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .000).

Stress. Both conditions recorded very low stress (< 4/100) at baseline, which increased considerably after the distress induction (physical-verbal: +11.75; verbal-physical:

+13.23; see Figure 29). After the intervention, both conditions decreased stress moderately (physical-verbal: - 8.91; verbal-physical: - 4.11).

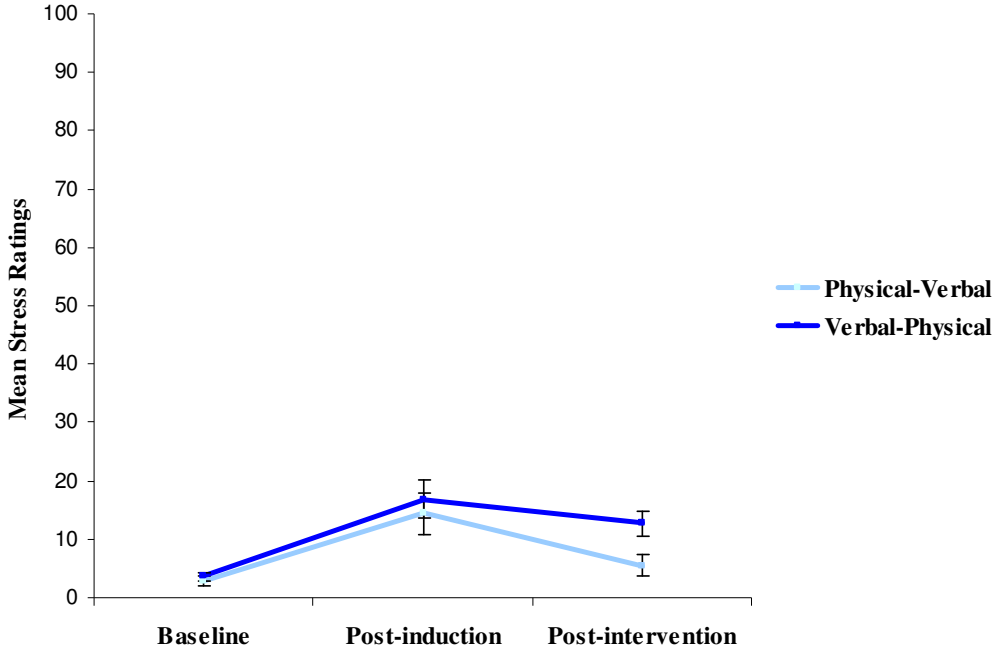

Figure 29. Mean stress ratings for each condition across time in Experiment 8.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilks' Lambda = .39, F (2, 21) = 16.18, p = .000, partial eta squared = .61] that accounted for a substantial amount of the variance (61%), but not for condition [F (1, 22) = 1.97, p = .17, partial eta squared = .08]. The interaction effect was also significant [Wilks' Lambda = .69, F (2, 21) = 4.78, p = .019, partial eta squared = .31] and accounted for a medium amount of the variance (31%). Two dependent t-tests showed a significant increase in stress from baseline to post-induction (p = .000) and a significant decrease from post-induction to post-intervention (p = .003).

RQ Results

The mean ratings on each of the five reactions to the distress induction at Stages 4 and 7 are presented separately below. Table 16 presents the data from each of the five reactions by time point and by condition.

Table 16
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 8

Reactions Questionnaire	Time	Physical-Verbal *M* (*SD*)	Verbal-Physical *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the sentence	Post-induction	37.81 (32.78)	29.89 (25.34)
	Post-intervention	32.08 (29.2)	23.12 (26.58)
Please rate how **believable** the sentence was to you	Post-induction	34.17 (26.28)	36.77 (27.02)
	Post-intervention	26.04 (25.43)	23.44 (28.86)
Please rate how **vivid** your thoughts and images are of the sentence	Post-induction	36.09 (25.91)	29.69 (35.17)
	Post-intervention	21.72 (29.47)	18.73 (25.32)
Please rate how much **guilt** you feel right now	Post-induction	29.89 (27.82)	31.82 (30.25)
	Post-intervention	23.38 (29.73)	25.68 (26.28)
Please rate how much you tried to **distract** from the sentence	Post-induction	42.18 (29.88)	45.42 (29.37)
	Post-intervention	40 (39.72)	49.01 (34.98)

At post-induction, participants in the physical-verbal condition were higher on their ratings of willingness, vividness and distraction, while the verbal-physical condition was higher on believability and guilt. However, a series of independent t-tests confirmed that these differences were not significant (all ps > .56). At post-intervention both conditions decreased willingness, believability, vividness and guilt. The physical-verbal condition decreased distraction while the verbal-physical increased. A series of 2x2 mixed between

ANOVAs revealed that time was significant for believability [Wilks' Lambda = .62, F (1, 22) = 10.28, p = .004, partial eta squared = .32] which accounted for a medium amount of the variance (32%) and vividness [Wilks' Lambda = .74, F (1, 22) = .74, p = .01, partial eta squared = .26] which also accounted for a medium amount of the variance, only (all other ps > .13).

Results Summary

In line with previous experiments, the conditions did not differ pre-experimentally on propensities towards avoidance. At baseline, both conditions were low on discomfort, anxiety and stress and all increased significantly at post-induction. Furthermore, the results demonstrated that the physical-verbal condition was the more effective in terms of distress reduction at post-intervention. Furthermore, both conditions decreased willingness, believability, vividness and guilt. The physical-verbal condition decreased distraction while the verbal-physical increased.

Discussion

Experiments 6 to 8 explored an alternative distress induction procedure to Experiments 1-5. Although the findings from all five initial studies showed that some version of Rachman et al.'s (1996) procedure reliably increased discomfort, anxiety and stress, the findings from Experiments 2-5 also suggested that the methodology did not lend itself well to incorporating several ACT-based brief analogue interventions. Indeed, it was difficult to determine whether this lack of effects pertained to the procedure itself or to the specific interventions selected.

Experiments 6-8 attempted to explore these issues using an alternative distress induction procedure. We also used this experimental change to investigate the potential

impact of mindfulness techniques which have attracted strong interest from ACT clinicians. Specifically, we investigated potential differences between physical and verbal mindfulness components in terms of the actual focus of the techniques.

Across all three studies, the outcomes were generally more positive than the previous experiments and in all cases the mindfulness components did reduce discomfort, anxiety and stress. Furthermore, the data also indicated specifically that the physical mindfulness technique showed some superiority over verbal mindfulness. Irrespective of these observed differences between ACT processes and mindfulness, the current findings showed that the revised procedure did integrate more effectively with the brief analogue components. Indeed, the fact that the self as context intervention in Experiment 6 was indecipherably as effective as mindfulness suggests that the previous lack of effects likely related to the procedure and not specifically to the interventions. This situation then begged the obvious question about the extent to which brief analogue ACT interventions would perform in a different distress induction procedure. This was a key concern in the two remaining experiments. Furthermore, we began to explore whether parsing out the basic processes in self as context components, as we had successfully done with the two mindfulness components, might generate more positive outcomes.

Chapter 5
Experiments 9 & 10

Experiments 9 & 10

Investigating Hierarchical vs. Distinction Relations in Self-based ACT Techniques

The integration of RFT and ACT is central to the CBS reticulated model and the programme of research it promotes and relies upon. In the General Introduction, we argued that the *third generation* of RFT research contained the beginnings of the integration of RFT and ACT through componential analyses and the application of RFT protocols to clinical samples (e.g. Keogh, 2008; Villatte et al., 2008). We also proposed that we are on the cusp of a *fourth generation* of RFT research that attempts to define concepts that are central to ACT in RFT terms. Experiments 9 and 10 are derived from this latter research endeavour and specifically explored ways in which RFT's perspective-taking and other relations may underpin ACT's self as context techniques.

Only one published study has investigated the way in which deictic relations may be altered using ACT-based techniques, such as defusion and self as context (i.e. Luciano et al., 2011). In their 'defusion I' condition, these researchers attempted to facilitate defusion or separation between the self and content with adolescents at high or low risk of conduct difficulties. For example, participants in the defusion I intervention were instructed to "*Just contemplate your thought as if you were contemplating a painting*". With a similar but naïve sample, their 'defusion II' condition employed a more extensive protocol of ACT-based techniques that specifically attempted to establish *hierarchical* relations between the self and the content (e.g. "*Imagine yourself so big as to have room for all of the thoughts you have had today*"). The findings indicated superiority on a range of measures of clinical improvement (including reductions in problem behaviour) for defusion II over defusion I. In short, it was more beneficial for the participants to learn to adopt a hierarchical perspective

with regard to their content, rather than a simply distinct perspective. These outcomes illustrated the potential conceptual and practical overlap between the deictic relations and self as context/defusion.

Because both are middle level terms, it is very difficult in ACT to distinguish defusion from self as context, both conceptually and technically. For example, Luciano et al.'s (2011) defusion research protocols I and II could readily be described as containing self as context techniques and both place heavy emphasis on the deictic relations. More specifically however, one might describe their defusion I protocol as distinction deictics and their defusion II protocol as hierarchical deictics.

The current research attempted to extend the original research by Luciano et al. (2011) and to explore further the potential role of the deictic relations in self as context techniques. Experiment 9 attempted to modify Luciano et al.'s (2011) interventions by specifically targeting distinction vs. hierarchical deictic relations. As before, we investigated the relative impact of these two manipulations on discomfort, anxiety and stress associated with the self-criticism task used in the previous experiments.

Experiment 9

An Empirical Investigation of Hierarchical vs. Distinction Relations in Self-based ACT Techniques

The present study attempted to modify Luciano et al.'s (2011) interventions by specifically targeting distinction vs. hierarchical deictic relations. The term preferred for the brief protocols employed here is self as context rather than defusion in order to emphasise that the interventions in fact were heavily focused on the self. The following examples illustrate the difference between deictic distinction and deictic hierarchical relations. Consider the common ACT Leaves on a Stream exercise in which clients are instructed to: "*Notice that you are here and your thoughts are there on a leaf floating down the stream"*. The deictic relations of YOU and HERE-THERE are explicitly stated, but the distinction relation between you and your thoughts via the HERE-THERE relation is implicit (i.e. YOU are here is *distinct* from your thoughts there). Now consider an instruction from the Observer Exercise: *"You are not just your body, your roles, your emotions, your thoughts. These things are the content of your life, while you are the arena, the context, the space in which they unfold"*. Again, the deictic YOU is explicitly stated, but in this case the relation between you and your content is clearly hierarchical (i.e. you are the context in which your thoughts exist).

The current study employed two brief self as context interventions with a non-clinical sample of undergraduates, asked to generate a negative self-criticism (i.e. the same distress induction procedure as Experiment 6-8). It is worth noting that we did not use the self as context intervention employed in Experiments 2-6. This is because we wanted to target specific relational frames in a similar way to Luciano et al (2011). A such, the interventions were abbreviations of those developed by Luciano et al., and one more explicitly emphasised the distinction between self and content, while the other emphasised a hierarchical relation

between these. Specifically, we investigated the relative impact of these two manipulations on discomfort, anxiety and stress associated with the self-criticism. We hypothesised that we would find similar results to Luciano et al. in that that the hierarchical self as context intervention would show superiority to the distinction self as context intervention.

Method

Participants

Forty-four adults participated in Experiment 9. All were undergraduate or postgraduate students at NUIM. The same exclusion criteria as Experiment 8 were employed. This yielded a final sample of 36 participants (14 males and 22 females), aged between 18 and 21 (M = 19.78 years). Participants were allocated randomly across two conditions, denoted as distinction self as context (N = 18) and hierarchical self as context (N = 18).

Setting and Materials

All aspects of the setting and materials were identical to Experiment 8.

Ethical Issues

All ethical issues pertaining to the previous experiments applied here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of seven stages. These were identical to Experiments 6-8 (see Figure 20, p. 119), except that the two interventions were modifications of self as context

exercises used in Luciano et al. (2011) with a specific focus on hierarchical versus distinction relations.

Stage 5: Interventions. The aim of the two self-based interventions (distinction self as context and hierarchical self as context) was to explore the comparative utility of each in reducing experimentally induced distress. Both interventions were brief adaptations of those reported by Luciano et al. (2011), in which defusion techniques assisted participants in identifying target thoughts and feelings and then shifting their perspective on these. The condition referred to by those researchers as defusion I manipulated the deictic relations primarily as *distinction* relations. In contrast, the condition referred to as defusion II manipulated the deictic relations as *hierarchical* relations. In their focus, both conditions appeared to encourage self as context, although each explicitly manipulated different relations. Hence, for current purposes, adaptations of these interventions are referred to as distinction self as context and hierarchical self as context.

Distinction self as context. In this condition, participants were presented with an intervention similar to Luciano et al's. (2011) defusion I. The deictic relations of I-YOU and HERE-THERE were explicitly targeted in order to facilitate the distinction between self and content. Participants were instructed as follows:

> For this part of the experiment, try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and just listen to the sound of my voice. For now, focus your attention on your breath. Try to feel the rise and fall of your stomach with each in-breath and out-breath you take. Now... just nod if you can notice your breathing. Inhale and exhale again and nod if you can notice that you are the one who is noticing your breathing. When you are ready, bring your attention to the thoughts going through your head in this very instance. Let the thoughts show up, whatever kind they are and let them go again. For example, you might be thinking of what you did yesterday. Try, if you can, to just notice that you are having this thought, observe it and then let it go again.
>
> Now, pick any one of these thoughts….any thought at all, good or bad will do. When you have one, try to imagine that you are taking this thought out of you and writing is down on an imaginary piece of paper in front of you. Imagine now that it's in front of you and just watch it…contemplate it as if you were contemplating a painting… just try to observe it.
>
> Now try to think of something that happened last week…notice what is coming into your mind. Ask yourself, who is having that memory? Now think of a word that is related to

> the memory… and with this word, do the same thing again…imagine yourself taking the word and writing it down. Put it out in front of you and just observe it… contemplate it as if you were contemplating a painting. Remember that this is just a thought or just a memory…you do not need to do anything with it, just observe it. Try to notice that you are here and the thought that you are contemplating is there, written in front of you. Again, just notice that it is you who is watching that thought.
>
> Now imagine how you would feel if you had nothing to eat all day. What feeling or sensation would you have? Now imagine that you can see that sensation or feeling of emptiness in your stomach. Imagine in your mind's eye that you can take a picture of the emptiness in your stomach and put this picture out in front of you. Do as before, just notice this feeling out in front of you, just contemplate it like a painting and when you're ready let it go again.
>
> Now try if you can to focus your attention on the negative thought you wrote down earlier in the experiment. Try to write down one word which describes how you feel when you have this thought. Maybe it is sadness…maybe it is anger… any feeling that comes to mind. Then when you are ready, open your eyes and write down that word on this piece of paper. Now put the word in the envelope and hand it to me. Closing your eyes again, focus your attention once more on that feeling that is in the envelope...imagine that you can take a picture of this feeling or emotion which is showing up for you and imagine placing the picture out in front of you. Now, look at this picture in front of you and notice who is looking at this feeling of *(word that describes reaction).*

Hierarchical self as context. In this condition, participants were presented with an intervention similar to Luciano et al's. (2011) defusion II. This intervention varied from the distinction self as context condition in that hierarchical relations were targeted to provide an even greater distance between self and content. Specifically, participants were instructed to see themselves as *above* their psychological content.

Participants in this group were instructed as follows:

> For this part of the experiment, try to relax yourself in the chair and get comfortable. When you're ready, I want you to close your eyes and just listen to the sound of my voice. For now, focus your attention on your breath. Try to feel the rise and fall of your stomach with each in-breath and out-breath you take. Now... just nod if you can notice your breathing. Inhale and exhale again and nod if you can notice that you are the one who is noticing your breathing. When you are ready, bring your attention to the thoughts going through your head in this very instance. Let the thoughts show up, whatever kind they are and let them go again. For example, you might be thinking of what you did yesterday. Try, if you can, to just notice that you are having this thought, observe it and then let it go again.
>
> Now, pick any one of these thoughts….any thought at all, good or bad will do. When you have one, try to imagine that you are taking this thought out of you and writing it down on an imaginary piece of paper in front of you. Imagine now that it's in front of you and just watch it…contemplate it as if you were contemplating a painting… just try to observe it. Nod if you can realize that it is you who is contemplating this thought? Can you realize that it is you who is watching this thought?

Now try to think of something that happened last week…notice what is coming into your mind. Ask yourself, who is having that memory? Now think of a word that is related to the memory… and with this word, do the same thing again…imagine yourself taking the word and writing it down. Put it out in front of you and just observe it… contemplate it as if you were contemplating a painting. Remember that this is just a thought or just a memory…you do not need to do anything with it, just observe it. Try to notice that you are here and the thought that you are contemplating is there, written in front of you. Again, just notice that it is you who is watching that thought. Now, try to imagine yourself so big that you can have room for all the thoughts that you have had today, for all the sensations, feelings and memories. Now, try to imagine yourself as being the captain of a boat and your thoughts and feelings as being the passengers. Again, imagine yourself so big that you have room for all of these thoughts and feelings. Imagine that your thoughts and feelings are like moles or freckles on your body. We all have moles or freckles and we can all walk wherever we want with them on our bodies. Imagine that your thoughts and feelings are like moles or freckles on your body. Now nod if you can notice that it is you who is imagining yourself with your thoughts and feelings like moles or freckles on your body. Can you see that you are more than your moles or freckles? Can you see that you are more than your thoughts and feelings?

Now try if you can to focus your attention on the negative thought you wrote down earlier in the experiment. Try to write down one word which describes how you feel when you have this thought. Maybe it is sadness… maybe it is anger… any feeling that comes to mind. Then when you are ready, open your eyes and write down that word on this piece of paper. Now put the word in the envelope and hand it to me. Closing your eyes again, focus your attention once more on that feeling that is in the envelope...imagine that you can take a picture of this feeling or emotion which is showing up for you and imagine placing the picture out in front of you. Now, look at this picture in front of you and notice who is looking at this feeling of *(word that describes reaction).* Try to imagine yourself when this *(word that describes reaction)* is in charge of what you do. Take a picture in your mind's eye of what you do when you let this feeling be in charge. Ask yourself who is in charge when you do that? Do you think it is you or your feelings? Now, imagine that you are who is in charge, instead of your *(word).* Imagine, now, that you place yourself over and above your *(word).* Take a photo of what comes to your mind when you see yourself over and above your *(word).* Try to see yourself as being in charge of what you do, instead of your feelings being in charge. Now, can you see that you are big enough to have room for any feeling, for any *(word)* and see that they are like moles or freckles and that you are the one in charge?

Results

The primary aim of Experiment 9 was to compare the relative utility of the two self as context interventions which differentially targeted distinction vs. hierarchical relations in reducing discomfort, anxiety and stress after exposure to the distress induction task.

AAQ Data

The pre-experimental outcomes for avoidance are presented in Table 17. Participants in both conditions scored within the normal range (i.e. < 18) and did not display any pre-experimental differences with regard to propensities towards avoidance. This was supported by an independent t-test which indicated no significant main effect for condition (p = .37).

Table 17
Means, Standard Deviations and Significance Value by Condition on the AAQ in Experiment 9

	Distinction Self as Context ***M*** **(*SD*)**	**Hierarchical Self as Context** ***M*** **(*SD*)**	***p*** **value**
AAQ	16.2 (6.3)	18.2 (6.4)	.37

M = Mean; *SD* = Standard Deviation; *p* value = Statistical Significance

Distress Ratings

The data from the three types of distress ratings was analysed separately and are presented below.

Discomfort. Both conditions recorded similarly low discomfort (<11/100) at baseline and increased modestly the distress induction (distinction self as context: +12.7; hierarchical self as context: +16.3; see Figure 30). Thereafter, distinction resulted in a very marginal increase in discomfort (+.76), while hierarchy resulted in a decrease (-7.57).

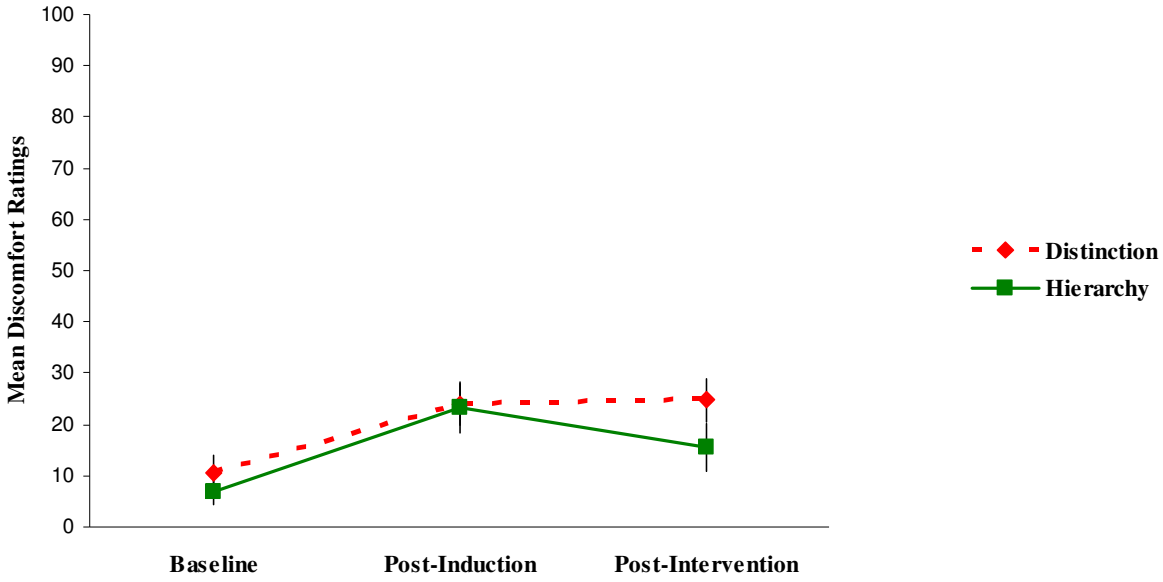

Figure 30. Mean VAS discomfort ratings per condition across time in Experiment 9.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .53, F (2, 33) = 14.58, p = .000, partial eta squared = .47] that accounted for a substantial amount of the variance (47%), but not for condition [F (1, 34) = 1, p = .32, partial eta squared = .03]. The interaction effect was also non-significant [Wilkes Lambda = .95, F (2, 33) = .81, p = .45, partial eta squared = .05]. Two dependent t-tests showed a significant increase in discomfort from baseline to post-induction (p = .001), but not from post-induction to post-intervention (p = .31).

Anxiety. Both conditions recorded similarly low anxiety (<10/100) at baseline and both increased anxiety modestly at post-induction (distinction: +8.06; hierarchy: +13.57; see Figure 31). Anxiety subsequently decreased for both conditions, although the larger change was recorded for the hierarchical intervention (distinction: -.029; hierarchy: -3.86).

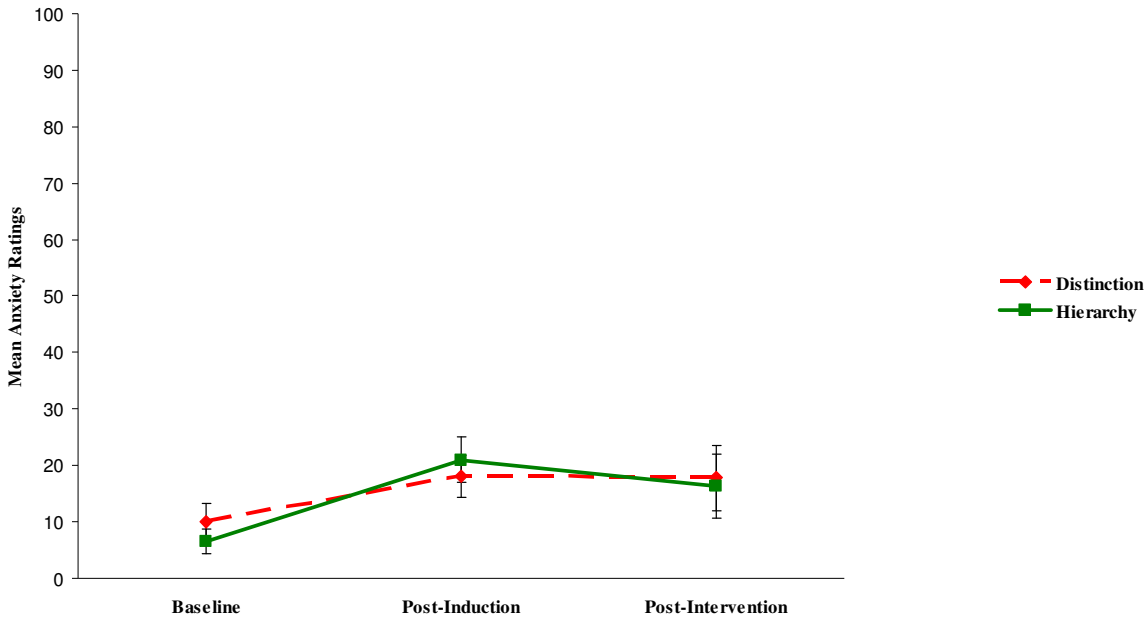

Figure 31. Mean VAS anxiety ratings per condition across time in Experiment 9.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .54, F (2, 33) = 14.12, p = .000, partial eta squared = .46] that accounted for a substantial amount of the variance (46%), but not for condition [F (1, 34) = .02, p = .89, partial eta squared = .001]. The interaction effect was non-significant [Wilkes Lambda = .94, F (2, 33) = .1.14, p = .33, partial eta squared = .07]. Two dependent t-tests showed a significant increase in anxiety from baseline to post-induction (p = .000), but not from post-induction to post-intervention (p = .46).

Stress. Both conditions recorded low stress (<11/100) at baseline and both increased stress moderately at post-induction (distinction: +7.43; hierarchy: +9.48; see Figure 32). Distinction resulted in an increase in stress (+4.71), while hierarchy reduced stress thereafter (-8.82).

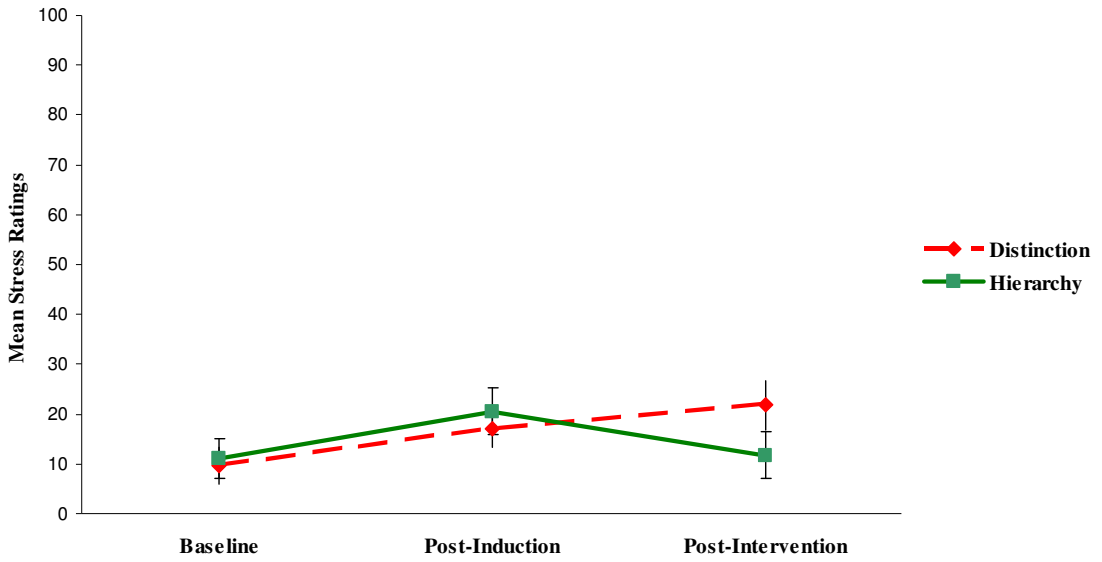

Figure 32. Mean VAS stress ratings per condition across time in Experiment 9.

A mixed between within 3x2 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .654, F (2, 33) = 8.74, p = .001, partial eta squared = .35] that accounted for a medium amount of the variance (35%), but not for condition [F (1, 34) = .1, p = .76, partial eta squared = .003]. However, the interaction was significant [Wilkes Lambda = .83, F (2, 33) = 3.46, p = 04, partial eta squared = .17] and accounted for a small amount of the variance (17%). Two dependent t-tests showed a significant increase in stress from baseline to post-induction for both conditions (both ps < .05). The increase in distinction from post-induction to post-intervention was not significant (p = .23), but the decrease for hierarchy at the same time point *was* significant (p = .02).

RQ Results

The four reaction questions were collated by condition and time and the means for each are presented in Table 18.

Table 18

The Means and Standard Deviations for the RQ across Time and Condition in Experiment 9

Reaction Questionnaire	Time	Distinction self as context *M* (*SD*)	Hierarchical self as context *M* (*SD*)
Please rate your level of **willingness** to engage with your thoughts of the sentence	Post-Induction	49.93 (27.34)	56.97 (28.93)
	Post-intervention	56.97 (24.65)	60.7 (32.34)
Please rate how **believable** the sentence was to you	Post-induction	55.04 (37.44)	73.26 (28.56)
	Post-intervention	48.4 (36.3)	60.97 (31.24)
Please rate how **vivid** your thoughts and images are of the sentence	Post-induction	53.25 (27.07)	66.56 (21.7)
	Post-intervention	48.6 (29.9)	63.5 (27.18)
Please rate how much **guilt** you feel right now	Post-induction	29.02 (30.13)	22.78 (26.23)
	Post-intervention	26.73 (29.3)	16.81 (24.75)
Please rate how much you tried to **distract** from the sentence	Post-induction	29.15 (26)	23.23 (20.3)
	Post-intervention	20.36 (22.12)	17.52 (15.45)

At post-induction, participants in the hierarchical condition were higher in believability, vividness and distraction, while the distinction participants were higher in willingness and guilt. However, a series of independent t-tests confirmed that these differences were not significant (all ps > .11).

At post-intervention both conditions increased willingness but decreased believability, vividness, guilt and distraction. A series of 2x2 mixed between ANOVAs revealed that time was significant for believability [Wilkes Lambda = .61, F (1, 34) = 21.55, p = .001, partial eta squared = .39] which accounted for a medium amount of the variance (39%) and distraction [Wilkes Lambda = .88, F (1, 34) = 4.82, p = .04, partial eta squared = .13] which accounted for a small amount of the variance (13%), (all other ps >.13)

Results Summary

The results demonstrated that the self-criticism task significantly increased discomfort, anxiety and stress. Some differences were recorded between the two interventions in terms of their efficacy in reducing the dependent measures. Although, there was no decrease in discomfort after the distinction intervention, a non-significant reduction was recorded for the hierarchical intervention. The same pattern was recorded with anxiety. In contrast, there was an increase in stress after the distinction intervention, but a significant reduction after the hierarchical intervention. Outcomes on the RQ demonstrated that both conditions increased willingness and decreased believability, vividness, guilt and distraction.

Discussion

The current study attempted to parse out the effects of distinction vs. hierarchical relations in a self as context ACT exercise. On the whole, the research was a replication of a previous study by Luciano et al. (2011), except that we were able to use less intensive interventions with our non-clinical sample. Nonetheless, the superiority observed for the hierarchical intervention, relative to distinction, bore some overlap with the findings from the original study.

The hierarchical intervention *only* resulted in a reduction in all three dependent measures, including a significant reduction in stress. This is consistent with Luciano et al.'s data (2011), in which the hierarchical intervention (defusion II) resulted in a significant reduction in problematic behaviours, along with a significant increase in mindfulness and psychological flexibility for the high-risk adolescents. The lack of effect for the distinction intervention is also similar to the findings from the original, in which Luciano et al. found only limited effects for the defusion I intervention. Experiment 10 explored this issue further by including a practice interval where participants were required to practice their assigned

intervention. We reasoned that this would potentially demonstrate the stability and generalization of outcomes across time and would be a better analogue of what happens in a therapeutic context.

Experiment 10

An Empirical Investigation of

Self-focused vs. Object-focused Techniques in ACT

Experiment 10 attempted to further explore the relative utility of distinction versus hierarchical interventions, using the same distress induction procedure as previous experiments. However, in an effort to extend the investigation presented in Experiment 9, the current study included a practice interval where participants were allowed a period of up to seven days to practice his/her assigned intervention after which they were presented with a second exposure to the distress induction task in order to investigate the long lasting effects of the interventions (i.e. hierarchical versus distinction).

A second aspect of the research examined the extent to which a focus on the self plays a key role in the outcomes described above. Specifically, this study compared interventions that focused on participants' thoughts about the self-criticism that comprised the distress induction procedure (i.e. self-focused) versus interventions that focused on thoughts about an inanimate object (i.e. object-focused). In short, participants in both groups were asked to focus on thoughts, but only in the self-focused interventions did they focus on thoughts about themselves. We hypothesised that the self hierarchical condition would be the most effective in terms of distress induction because it aimed to target both self specific content and hierarchical relations.

Method

Participants

A total of 59 adults were recruited for Experiment 10. All were undergraduate or postgraduate students at NUIM. The same exclusion criteria as the previous experiment applied (11 participants were excluded on this basis). This yielded a final sample of 48 participants (22 males and 28 females), aged between 17 and 41 years old (mean age = 20 years, 5 months). Participants were allocated randomly to one of four conditions, referred to as: self distinction (N = 12); self hierarchy (N = 12); object distinction (N = 12); and object hierarchy (N = 12).

Setting and Materials

All aspects of the setting and materials were identical to Experiment 9.

Ethical Issues

All ethical issues pertaining to all previous experiments applied here and were addressed in a similar manner (see pp. 52-53). Once again, no participants raised any issues or reported any adverse effects at any point.

Procedure

The current study comprised of two stages. Participants completed the first stage and then returned for the second stage after a practice period that ranged from two to seven days in length. Each stage comprised of seven phases which were identical in format to Experiment 9 (see Figure 33). The phases involved: pre-experimental measures (Phase 1); baseline VAS ratings (Phase 2); the distress induction procedure (Phase 3); post-induction

VAS ratings and RQ (Phase 4); one of four interventions (Phase 5); post-intervention distress induction (Phase 6); and post-intervention VAS ratings and RQ (Phase 7).

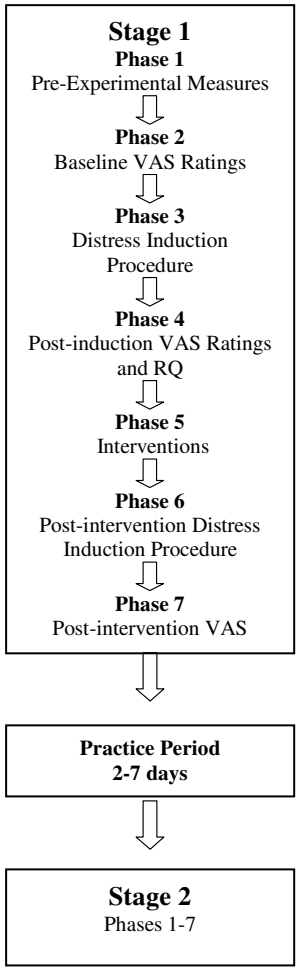

Figure 33. An overview of the experimental sequence in Experiment 10.

Stage 1: Phase 5: Interventions. The aim of all four interventions (self distinction, self hierarchy, object distinction and object hierarchy) was to explore the comparative utility of each in reducing experimentally induced distress. Both self-focused interventions (self distinction and self hierarchy) attempted to distance participants from his/her stated self-criticism. In contrast, the two object-focused conditions attempted to distance participants from a non self-related object (a rose). Within each of these two pairs of conditions, the

experimental design also sought to manipulate the relational nature of this distancing, through which distinction or hierarchy relations were specifically targeted. Hence, this created four conditions in total, two self-focused (self hierarchy and self distinction) and two object-focused (object hierarchy and object distinction).

Self distinction. Participants assigned to the self distinction condition were presented with a common ACT exercise called the *Leaves on the Stream* in which they were instructed to close their eyes and notice the on-going emergence of their own thoughts. In ACT, this exercise commonly involves placing one's own psychological content (thoughts and feelings) on leaves and this self-focus was also the target in the intervention, as employed here. Specifically, participants were instructed to take the stated self-criticism and their reactions to this and to place each one on a leaf and allow each leaf to float downstream. The distinction focus of this exercise was manipulated through an emphasis on noticing the distinction between having thoughts HERE and placing them THERE in the stream. Participants in this condition were instructed as follows:

> Imagine a beautiful slow-moving stream. The water flows over rocks, around trees, descends down hill and travels through a valley. Once in a while, a big leaf drops into the stream and floats away down the river. Imagine you are sitting beside that stream on a warm sunny day, watching the leaves float by.
>
> Now direct your attention to the thoughts and images that are passing through your mind in this very instance. Let all of the thoughts come into your mind whatever they are, good or bad, it doesn't matter. Just try to become conscious of your thoughts. Each time a thought pops into your head, imagine putting it on one of those leaves. Some people have a hard time putting thoughts into words and they see thoughts as images. If that applies to you, put each image on a leaf floating down the stream. The goal is to stay beside the stream and allow the leaves on the stream to keep floating by. Don't try to make the stream go faster or slower; don't try to change what shows up on the leaves in any way. Just place any thought on a leaf and simply watch it float down the stream.
>
> Just for now, focus your attention on one specific thought. Any single thought will do, good or bad, it doesn't matter. Just try to isolate that thought in your mind. Try this exercise with that thought. Put it on a leaf and let it float down the stream. Just imagine yourself on the side of the bank watching this thought float away down the stream.
>
> Try the exact same thing again, but this time use the specific thought that you wrote down earlier on in the experiment. Put this negative thought on a leaf and let it float down the stream. If you can notice any reaction you have to this, maybe like another thought, or a feeling, put that on a leaf as well and let it float down the stream. Remember that the goal is to stay beside the stream and allow the leaves on the stream to keep floating by.

Self hierarchy. Participants assigned to the self hierarchy condition were also presented with the *Leaves on the Stream* exercise in order to notice the on-going emergence of their thoughts. Hence a self-focus was again the target in this intervention. However, the exercise was now given a hierarchical (rather than distinction) focus through an emphasis on noticing that one can contain one's own thoughts HERE and from that perspective these thoughts can be placed THERE in the stream. Participants in this condition were instructed as follows:

> Imagine a beautiful slow-moving stream. The water flows over rocks, around trees, descends down hill and travels through a valley. Once in a while, a big leaf drops into the stream and floats away down the river. Imagine you are sitting beside that stream on a warm sunny day, watching the leaves float by.
>
> Now direct your attention to the thoughts and images that are passing through your mind in this very instance. Let all of the thoughts come into your mind whatever they are, good or bad, it doesn't matter. Just try to become conscious of your thoughts. Each time a thought pops into your head, imagine putting it on one of those leaves. Some people have a hard time putting thoughts into words and they see thoughts as images. If that applies to you, put each image on a leaf floating down the stream. The goal is to stay beside the stream and allow the leaves on the stream to keep floating by. Don't try to make the stream go faster or slower; don't try to change what shows up on the leaves in any way. Just place any thought on a leaf and simply watch it float down the stream.
>
> Just for now, focus your attention on one specific thought. Any single thought will do, good or bad, it doesn't matter. Just try to isolate that thought in your mind. Try this exercise with that thought. Put it on a leaf and let it float down the stream. Just imagine yourself on the side of the bank watching this thought float away down the stream. And just notice that it is you who is noticing your thoughts. Be aware that you are here and your thoughts and images are there on a leaf floating down the stream.
>
> Try the exact same thing again, but this time use the specific thought that you wrote down earlier on in the experiment. Put this negative thought on a leaf and let it float down the stream. If you can notice any reaction you have to this, maybe like another thought, or a feeling, put that on a leaf as well and let it float down the stream. Remember that the goal is to stay beside the stream and allow the leaves on the stream to keep floating by.
>
> Remember that your task is to let your stream flow. It is unlikely, however, that you will be able to do this without interruption. And this is the key part of this exercise. At some point you will have the sense that the stream has stopped, or that you have lost the point of the exercise, or that you are down in the stream instead of being up on the bank. When that happens, try to back up a few seconds and see whether you can catch what you were doing right before the stream stopped or you fell in. Then go ahead and put your thoughts on the leaves again until the stream stops for a second time and so on. The main thing is to notice when it stops for any reason and see whether you can catch what happened right before it stopped. It is also important to notice that you are the one noticing all of your thoughts floating down the stream. Remember that you are here and all of those thoughts are there, on the leaves floating down the stream.

> One more thing. If the stream never gets going at all and you start thinking "It's not working" or "I'm not doing it right" then let that thought be placed on a leaf and send it down the stream as well.

Object distinction. Participants assigned to the object distinction condition were also presented with the *Leaves on the Stream* exercise, but rather than encouraging them to notice the on-going emergence of their own thoughts, the exercise now instructed them to generate thoughts and images of a red rose (as an inanimate object). Specifically, participants were instructed to take individual and on-going thoughts or images of the rose and place each on a leaf. As a result, this intervention was denoted as *object-focused*, rather than self-focused. As before, the distinction focus of this exercise was maintained by highlighting the distinction between having thoughts about the rose HERE and placing then THERE in the stream. Participants in this condition were instructed as follows:

> Imagine a beautiful slow-moving stream. The water flows over rocks, around trees, descends down hill and travels through a valley. Once in a while, a big leaf drops into the stream and floats away down the water. Imagine you are sitting beside that stream on a warm sunny day, watching the leaves float by.
>
> Now direct your attention to the image of a red rose. Let all of the thoughts and images about a red rose come into your mind whatever they are, good or bad, it doesn't matter. Just try to become conscious of your thoughts about this flower. Each time a thought or image about the rose pops into your head imagine putting it on one of those leaves. Some people have a hard time putting thoughts into words and they see thoughts as images. If that applies to you, put each image of the flower on a leaf and let it float down the stream. The goal is to stay beside the stream and allow the leaves on the stream to keep floating by. Don't try to make the stream go faster or slower; don't try to change what shows up on the leaves in any way. Just place any thought about the flower on a leaf and simply watch it float down the stream.
>
> It may help to focus your attention on one specific petal on the rose. Any single petal will do, it doesn't matter. Just try to isolate the thought or the image of one rose petal in your mind. Try this exercise with this image of the rose petal. Put it on a leaf and let it float down the stream. Just imagine yourself on the side of the bank watching this thought or image float away down the stream.
>
> Try the exact same thing again, with another rose petal or another part of the rose, perhaps even the stem. Put this thought or image you are having on a leaf and let it float down the stream. Remember that the goal is to stay beside the stream and allow the leaves on the stream to keep floating by.

Object hierarchy. Participants assigned to the object hierarchy condition were also presented with the *Leaves on the Stream* exercise to notice the on-going emergence of

thoughts and images of a red rose. As before, the exercise was given a hierarchical focus through an emphasis on noticing that one can contain one's own thoughts about the rose HERE and from that perspective these thoughts can be placed THERE in the stream. Participants in this condition were instructed as follows:

> Imagine a beautiful slow-moving stream. The water flows over rocks, around trees, descends down hill and travels through a valley. Once in a while, a big leaf drops into the stream and floats away down the river. Imagine you are sitting beside that stream on a warm sunny day, watching the leaves float by.
>
> Now direct your attention to the image of a red rose. Let all of the thoughts and images about a red rose come into your mind whatever they are, good or bad, it doesn't matter. Just try to become conscious of your thoughts about this flower. Each time a thought or image about the rose pops into your head imagine putting it on one of those leaves. Some people have a hard time putting thoughts into words and they see thoughts as images. If that applies to you, put each image of the flower on a leaf and let it float down the stream. The goal is to stay beside the stream and allow the leaves on the stream to keep floating by. Don't try to make the stream go faster or slower; don't try to change what shows up on the leaves in any way. Just place any thought about the flower on a leaf and simply watch it float down the stream.
>
> It may help to focus your attention on one specific petal on the rose. Any single petal will do, it doesn't matter. Just try to isolate the thought or the image of one rose petal in your mind. Try this exercise with this image of the rose petal. Put it on a leaf and let it float down the stream. Just imagine yourself on the side of the bank watching this thought or image float away down the stream. And just notice that it is you who is noticing your thoughts about the rose. Be aware that you are here and your thoughts and images about the flower are there on a leaf floating down the stream.
>
> Try the exact same thing again, with another rose petal or another part of the rose, perhaps even the stem. Put this thought or image you are having on a leaf and let it float down the stream. If you can notice any reaction you have to this, maybe like another thought, or a feeling, put that on a leaf as well and let it float down the stream. Remember that the goal is to stay beside the stream and allow the leaves on the stream to keep floating by.
>
> Remember that your task is to let your stream flow. It is unlikely, however, that you will be able to do this without interruption. And this is the key part of this exercise. At some point you will have the sense that the stream has stopped, or that you have lost the point of the exercise, or that you are down in the stream instead of being up on the bank. When that happens, try to back up a few seconds and see whether you can catch what you were doing right before the stream stopped or you fell in. Then go ahead and put the thoughts you were having about the rose on the leaves again until the stream stops for a second time and so on. The main thing is to notice when it stops for any reason and see whether you can catch what thought or image about the rose you were having right before it stopped. It is also important to notice that you are the one noticing all of your thoughts about the flower floating down the stream. Remember that you are here and all of those thoughts and images about the rose are there, on the leaves floating down the stream.

Phase 6: Distress induction task II. Phase 6 involved a second exposure to the distress induction task which was identical to Phase 3.

Phase 7: Post-intervention VASs and RQ. Phase 7 was identical to Phase 4 and assessed the potential impact of the self-criticism on discomfort, anxiety and stress, as well as participant reactions to the experimental task.

Practice Period. Stages 1 and 2 were separated by a practice period that ranged from 2-7 days, during which participants were instructed to practice the intervention they had been given in Phase 5, using a written script. The number of practice days was decided by participants' own schedules and could not be manipulated systematically.

Stage 2: Phases 1 to 7. Stage 2 was identical to Stage 1.

Results

The central aim of the current experiment was to compare the relative utility of the four interventions on reducing discomfort, anxiety and stress after the distress induction task. A secondary aim was to investigate the utility of interventions which targeted self-specific content compared to interventions which did not. A third aim was to determine the role of the practice period and its relationship to the interventions on the distress ratings.

AAQ Data

At the outset of the experiment in Stage 1, all conditions scored within or just above the normal range on the AAQ for a non-clinical sample and did not display any pre-experimental differences at baseline with regard to propensities towards avoidance (self distinction = 17.33; self hierarchy = 17.42; object distinction = 19.42; and object hierarchy = 18.42; see Figure 34). A one-way between groups ANOVA confirmed that there was no significant effect for condition ($p = .86$). The AAQ data is presented in a graph here (instead

of a table like previous experiments) so the change in scores at Stage 2 can be better represented.

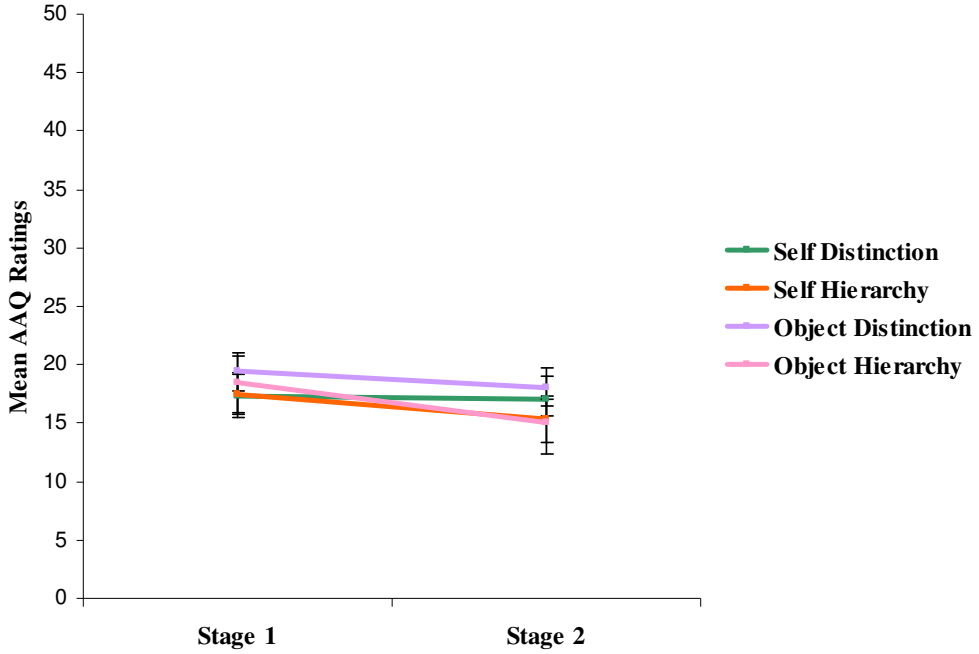

Figure 34. Mean AAQ scores per condition at Stages 1 and 2 in Experiment 10.

At the beginning of Stage 2 and immediately after the practice period, all participants were re-exposed to the AAQ and all four conditions showed a small decrease in scores relative to baseline (self distinction: - .25; self hierarchy: - 2.09; object distinction: - 1.24; object hierarchy: - 3.42; see Figure 34). Interestingly, a paired-samples t-test showed a significant main effect for time ($p = .004$) between Stages 1 and 2. Furthermore, four paired samples t-tests (one per condition) revealed that the decreases in AAQ scores in the self hierarchy and object hierarchy conditions were significant ($p = .05$ and .03, respectively), while the changes in the distinction self and distinction object conditions were not (both $ps > .18$).

Distress Ratings

The data from the three types of distress ratings were analysed separately and are presented below.

Discomfort. All four conditions recorded low to moderate discomfort (all > 30/100) at baseline I (Stage 1) and all increased (self distinction: +15.67; self hierarchy: +13.42; object distinction: +2.08; object hierarchy: +18.51; see Figure 35) after the first exposure to the distress induction task. Thereafter, the first exposure to the intervention resulted in a decrease in discomfort in all four conditions. The largest of these occurred in the two self conditions and the smallest in the object distinction condition (self distinction: - 16.12; self hierarchy: -16.34; object distinction: - 9.72; object hierarchy: - 13.1). All four conditions had decreased further by baseline II in Stage 2 (self distinction: - 14.14; self hierarchy: - 4; object distinction: - 10.37; object hierarchy: - 11.23) and were lower at this point than at baseline I. Similar to Stage 1, discomfort increased for all conditions after post-induction II (self distinction: +15.19; self hierarchy: +14.52; object distinction: +13.29; object hierarchy: +11.97). Finally, in all four conditions discomfort decreased again to lowest levels at post-intervention II (self distinction: - 11.28; self hierarchy: - 18.48; object distinction: - 15.94; object hierarchy: - 10).

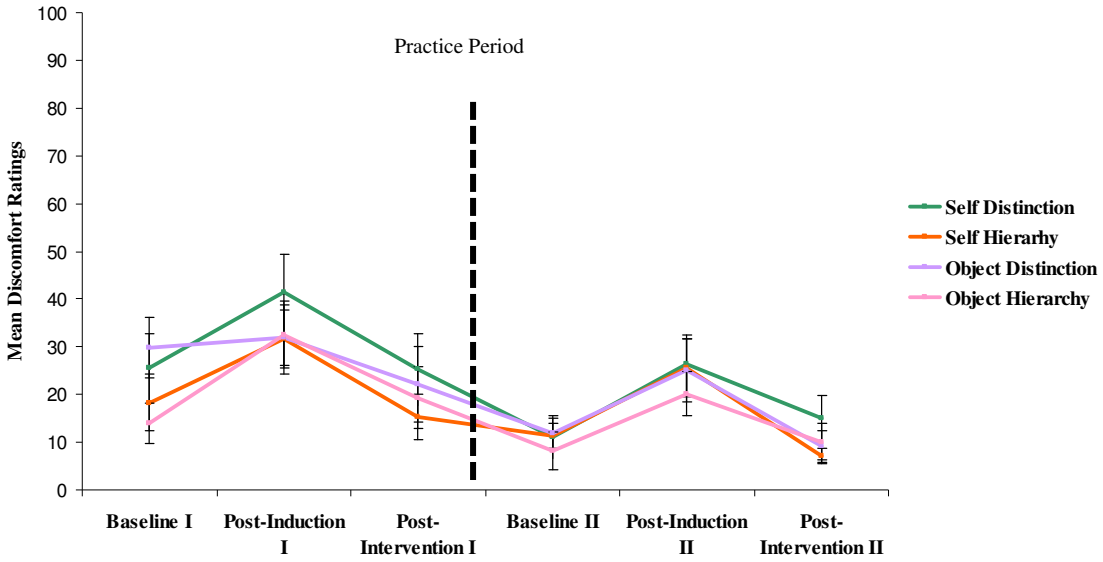

Figure 35. Mean discomfort ratings per condition across time in Experiment 10.

A mixed between within 6x4 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .34, F (5, 40) = 15.24, p = .000, partial eta squared = .66] that accounted for a large amount of the variance (66%), but not for condition [F (3, 44) = .54, p = .66, partial eta squared = .04]. In addition, the interaction effect was not significant [Wilkes Lambda = .88, F (5, 42) = .58, p = .88, partial eta squared = .07].

Five dependent t-tests compared each time point with the subsequent time point (e.g. baseline I vs. post-induction I) and demonstrated a significant effect for time at all five time points. That is, discomfort increased significantly after the two distress inductions and decreased significantly after the interventions and the practice period (all ps < .05).

Anxiety. All four conditions recorded low to moderate anxiety (all > 24/100) at baseline I and all increased modestly (self distinction: +14.14; self hierarchy: +7.33; object distinction: +11.7; object hierarchy: +18.12; see Figure 35) at post-induction I. In all four conditions, the first exposure to the intervention resulted in decreased anxiety, with the largest in self distinction (- 17.41) and the smallest in object distinction (- 10.46; self hierarchy: - 12.91; object hierarchy: - 16.87). All four conditions decreased anxiety further by

baseline II (self distinction: - 6.08; self hierarchy: - 3.67; object distinction: - 2.91; object hierarchy: - 4.73). Similar to Stage 1, anxiety increased for all conditions at post-induction II (self distinction: +12.18; self hierarchy: +10.58; object distinction: +13.49; object hierarchy: +8.39) and in all four conditions anxiety decreased to lowest levels at post-intervention II (self distinction: - 10.59; self hierarchy: - 10.83; object distinction: - 19.88; object hierarchy: - 7.8).

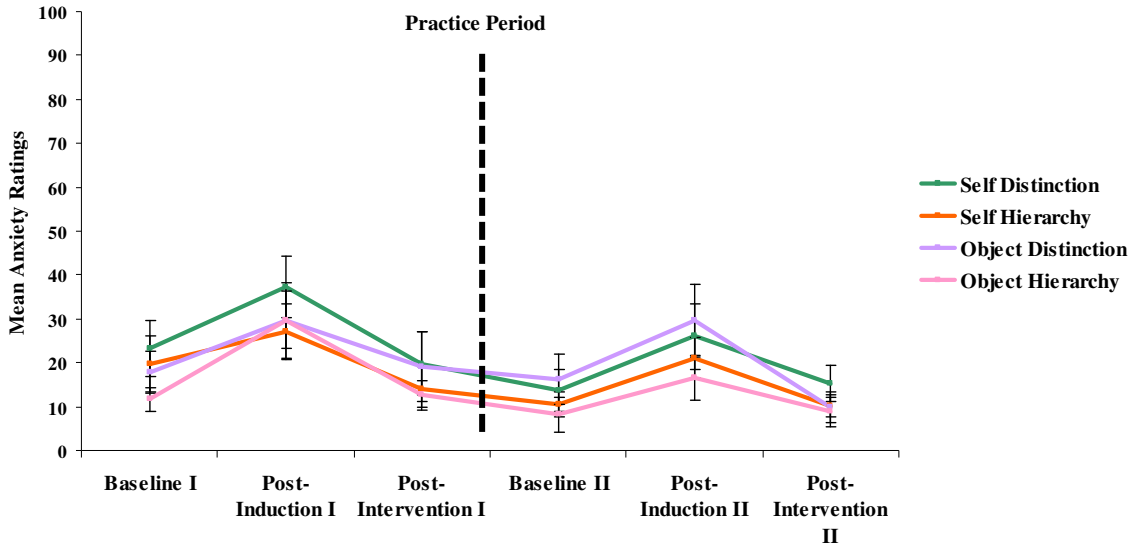

Figure 35. Mean anxiety ratings per condition across time in Experiment 10.

A mixed between within 6x4 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .43, F (5, 40) = 10.44, p = .000, partial eta squared = .57] that accounted for a substantial amount of the variance (57%), but not for condition [F (3, 44) = .77, p = .52, partial eta squared = .05] or the interaction effect [Wilkes Lambda = .71, F (5, 42) = 1, p = .47, partial eta squared = .11].

Five dependent t-tests compared each time point with the subsequent one and demonstrated a significant effect for time in four of these five comparisons (except between post-intervention I and baseline II, p = .23). That is, anxiety increased significantly after the two distress inductions and decreased significantly after the interventions (all ps < .001).

Stress. All four conditions recorded low to moderate stress (all > 19/100) at baseline I and all increased (self distinction: +8.84; self hierarchy: +9.42; object distinction: +14.8; object hierarchy: +8.63; see Figure 36) at post-induction I. All four conditions showed a similar modest decrease in stress at post-intervention I (self distinction: - 9.82; self hierarchy: - 13.82; object distinction: - 11.87; object hierarchy: -14.68). Stress levels had changed differentially by baseline II. That is, self distinction and self hierarchy decreased marginally (-.29 and -1.84, respectively), while object hierarchy increased marginally (+4.59) and distinction object increased moderately (+11.17). Similar to Stage 1, stress increased for all four conditions at post-induction II (distinction self: +8.79; self hierarchy: +6.92; object distinction: +2.01; object hierarchy: +5.94). Finally, in all four conditions stress decreased to lowest levels at post-intervention II (self distinction: - 7.75; self hierarchy: - 9.67; object distinction: -21.8; object hierarchy: - 10.02).

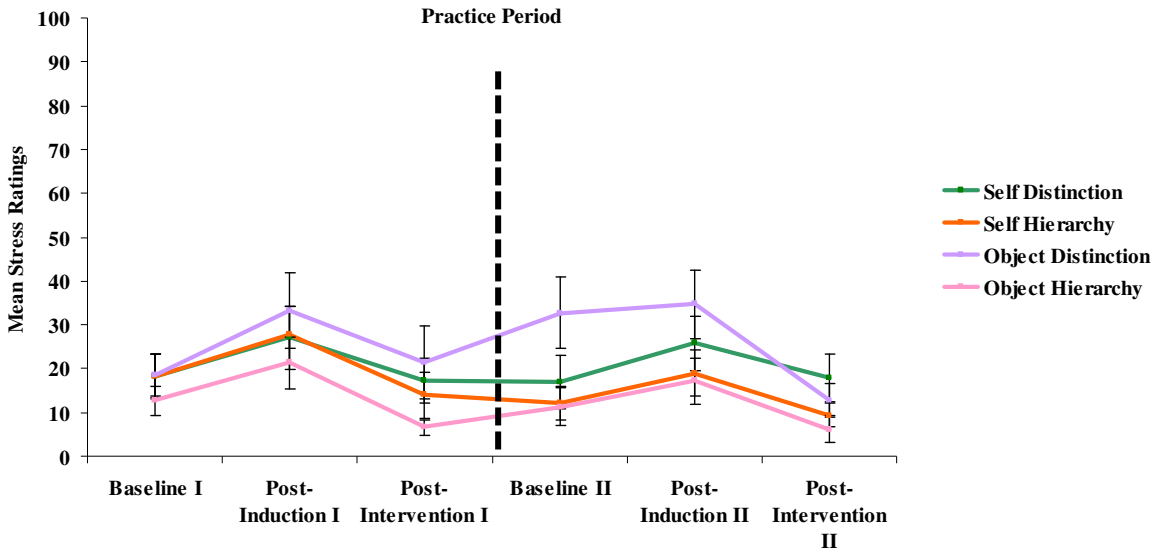

Figure 36. Mean stress ratings per condition across time in Experiment 10.

A mixed between within 6x4 ANOVA revealed a highly significant main effect for time [Wilkes Lambda = .52, F (5, 40) = 7.5, p = .000, partial eta squared = .48] that accounted for a substantial amount of the variance (48%), but not for condition [F (3, 43)

= 2.14, p = .11, partial eta squared = .12]. The interaction effect was not significant [Wilkes Lambda = .56, F (5, 42) = 1.71, p = .059, partial eta squared = .17]. The five dependent t-tests comparing subsequent time points demonstrated a significant effect for time at four of these, except between post-intervention I and baseline II (p = .41). That is, stress increased significantly after the two distress inductions and decreased significantly after the interventions (all ps < .001).

Due to the near significant effect for the interaction and the strong effect for time, the data were split for condition and five dependent t-tests were performed again using the same five time point comparisons. This would enable us to determine which specific conditions and time points were significant. Self distinction showed a significant increase in stress at post-induction II (p = .034) and a near significant decrease at post-intervention II (p = .058). Self hierarchy showed a significant decrease at post-intervention I (p = .05) and at post-intervention II (p = .051). Object distinction showed a significant decrease at post-intervention II (p = .003). Finally, object hierarchy showed a significant decrease at post-intervention I (p = .009), a significant increase at post-induction II (p = .05) and a significant decrease at post-intervention II (p = .005), all other ps > .09.

Practice Period Data

The means and standard deviations for the length of the practice period in days and the number of times participants practiced their assigned intervention are presented in Table 19.

Table 19
Means and Standard Deviations for the Length of the Practice Period and Amount Participants Practiced per Condition in Experiment 10

	Self Distinction M (SD)	**Object Distinction M (SD)**	**Self Hierarchy M (SD)**	**Object Hierarchy M (SD)**
Length of Practice Period	6.2 (1.6)	5.8 (1.59)	6.8 (1.42)	6.33 (2.31)
Amount of Practice	3.2 (1.75)	2.33 (1.72)	1.67 (1.67)	3.17 (1.4)

A series of bi-variate correlations (for each condition) were conducted using the Pearson product-moment correlation coefficient to investigate whether discomfort, anxiety, stress and AAQ scores (in Stage 2) correlated with either the length of the practice period or the number of times participants practiced (see Table 20).

Table 20
Correlations between Length of Practice Period, Practice Amount and Distress during Stage 2 in Experiment 10

		Baseline II				**Post-Induction II**			**Post-Intervention II**		
		AAQ II	**Dis.**	**Anx.**	**Stress**	**Dis.**	**Anx.**	**Stress**	**Dis.**	**Anx.**	**Stress**
Self Distinction	**Length of Practice Period**	-.26	-.23	-.49	-3.8	-.27	-4.19	-.27	-.29	-.18	-.25
	Practice amount	-.47	-.02	-.14	-.1	.04	.01	.04	.11	.06	.08
Self Hierarchy	**Length of Practice Period**	.07	-.13	-5.7	-.41	-.02	-45	-.43	-.54	-.79***	-.69**
	Practice amount	-.08	.08	-.14	.41	.25	.17	.29	-.32	-.4	-.11
Object Distinction	**Length of Practice Period**	.47	.48	.24	.46	.42	.3	.5	.45	.46	.46
	Practice amount	-.23	-.18	-.18	.28	-.22	-.23	.12	-.12	-.22	.09
Object Hierarchy	**Length of Practice Period**	-.7**	-.53	-.58*	-.37	-.58*	-.43	-.34	-54	-48	-36
	Practice amount	-.28	-.3	-.34	-.33	-.38	-.34	-.17	-.4	-.36	-.31

* p > .05 ** p > .01 *** p > .001

Results for the self distinction condition demonstrated small to medium correlations (although they were not significant), suggesting that the longer the practice period, the lower AAQ, discomfort, anxiety and stress ratings at each time point. In addition, the more often

participants practiced their assigned intervention, the lower they scored on the AAQ, discomfort and anxiety ratings at baseline II. However, the results also suggested that the more they practiced the self distinction intervention, the higher their stress ratings at each time point throughout Stage 2. For the object distinction condition, strong (but non significant) correlations suggested that a longer practice period was correlated with more discomfort, anxiety and stress at all time points in Stage 2. Small (and non significant) correlations suggested that the more participants practiced this intervention the lower they rated their discomfort and anxiety during Stage 2. Alternatively, higher rates of practice were correlated with more stress throughout this stage.

For the self hierarchy intervention, a longer practice period was also associated with lower scores on the AAQ and in all distress ratings throughout Stage 2. These correlations were particularly strong and significant for anxiety at baseline II and for discomfort, anxiety and stress at post-intervention II. The object hierarchy condition demonstrated a strong and significant (on most occasions) correlation between the length of the practice period, the AAQ and distress levels, such that a longer practice period was correlated with lower scores on the AAQ and less discomfort, anxiety and stress at every time point in Stage 2. In addition, strong (but non-significant) correlations suggested that the more participants practiced this intervention, the lower they scored on the AAQ, discomfort, anxiety and stress ratings at every time point in this stage.

A series of bi-variate correlations were also conducted using the Pearson product-moment correlation coefficient to investigate whether AAQ scores at both baselines (Stage 1 and Stage 2; see Table 21) correlated with ratings of discomfort, anxiety and stress throughout the experiment. The results demonstrated strong and significant correlations between the AAQ and the distress ratings at almost every time point, excluding the correlation between the AAQ, anxiety and stress ratings at baseline I.

Table 21
Correlations between AAQ and Distress Ratings for Stages 1 and 2 in Experiment 10

	Baseline			Post- Induction			Post-Intervention		
	Dis.	**Anx.**	**Stress**	**Dis.**	**Anx.**	**Stress**	**Dis.**	**Anx.**	**Stress**
AAQ Baseline I	.33*	1.85	.202	.463**	.363**	.37**	.84***	.31*	.3*
AAQ Baseline II	.554***	.485***	.444**	.301*	.348*	.426**	.425**	.416**	.372**

* p > .05 ** p > .01 *** p > .001

RQ Results

The four reactions questions were collated by condition and stage and the means for each are presented in Table 22.

Table 22
The Means and Standard Deviations for the RQ across Time and Condition in Experiment 10

Reactions Questionnaire	**Time**	**Self Distinction** ***M*** **(*SD*)**	**Self Hierarchy** ***M*** **(*SD*)**	**Object Distinction** ***M*** **(*SD*)**	**Object Hierarchy** ***M*** **(*SD*)**
Please rate your level of **willingness** to engage with your thoughts of the sentence	Post-induction I	57.24 (27.24)	56. 08 (19.81)	64. 95 (22.02)	45. 58 (31. 9)
	Post-intervention I	60. 72 (32. 59)	65. 42 (23. 86)	59. 63 (28. 18)	49. 69 (31. 27)
	Post-induction II	53. 97 (25. 57)	49. 53 (30.53)	48. 58 (25. 29)	42. 12 (27.94)
	Post-intervention II	58. 12 (24. 81)	58.67 (28.52)	50. 05 (29.43)	41. 66 (32. 63)
Please rate how **believable** the sentence was to you	Post-induction I	64.76 (25.1)	59.04 (26.97)	53.95 (18.6)	75.91 (14.91)
	Post-intervention I	57.43 (27.32)	47.75 (21.6)	43.46 (23.65)	53.38 (21.54)
	Post-induction II	56.5 (23.94)	47.33 (32.91)	59.42 (19.21)	51.5 (28.41)
	Post-intervention II	46.02 (25.19)	36.67 (23.95)	45.2 (16.82)	38.3 (27.17)
Please rate how **vivid** your thoughts and images were of the sentence	Post-induction I	62.72 (19.29)	49.83 (28.81)	55.74 (20.07)	67.41 (23.33)
	Post-intervention I	53.04 (21.8)	30.08 (17.64)	44.32 (18.44)	44.97 (28)
	Post-induction II	54.88 (26.73)	50.58 (21.22)	59.87 (21.17)	54.99 (25.53)
	Post-intervention II	34.27 (22.4)	33.92 (19.5)	38.13 (16.36)	39.82 (27.22)
Please rate how much **guilt** you feel right now	Post-induction I	34.42 (27.63)	37.42 (22.81)	24.21 (21.54)	38.53 (33.4)
	Post-intervention I	28.25 (28.68)	21 (19.01)	20.3 (16.18)	19.27 (18.71)
	Post-induction II	31.01 (23.07)	40 (20.94)	31.51 (28.25)	18.28 (20.28)
	Post-intervention II	25.68 (21.09)	33.25 (31.26)	16.51 (17.03)	14.23 (20.76)
Please rate how much you tried to **distract** from the sentence	Post-induction I	44.13 (26.83)	31.67 (28.7)	45.56 (21.45)	48.39 (29.31)
	Post-intervention I	33.23 (29.21)	30.69 (29.28)	28.16 (28.7)	28.5 (23.18)
	Post-induction II	29.3 (19.87)	35 (29.23)	28.91 (21.32)	36.42 (29.81)
	Post-intervention II	23.51 (23.02)	31.75 (27.65)	22.96 (23.62)	22.02 (21.04)

At post-induction I, willingness, believability, vividness, guilt and distraction were similar for all three conditions. A series of one-way ANOVAs revealed that none of these differences were significant (all ps > .43). At post-intervention I all conditions decreased

believability, vividness, guilt and distraction. Willingness increased for self distinction, self hierarchy and object distinction at this point, while objective distinction decreased. At post-induction II, all conditions decreased willingness, believability and vividness. Guilt increased for self distinction, self hierarchy and object distinction but decreased for object hierarchy. Distraction increased for self distinction, self hierarchy and object distinction, but it increased for object hierarchy. At post-intervention II, all conditions decreased believability, vividness, guilt and distraction. Self distinction, self hierarchy and object distinction increased willingness, while object hierarchy decreased it.

A series of mixed between within 4x4 ANOVA revealed a significant effect for time for believability [Wilkes Lambda = .44, F (3, 42) = 10.81, p = .000, partial eta squared = .44] that accounted for a substantial amount of the variance (44%), for vividness [Wilkes Lambda = .42, F (3, 42) = 19.22, p = .000, partial eta squared = .58] that accounted for a substantial amount of the variance (58%), for guilt [Wilkes Lambda = .65, F (3, 42) = 7.4, p = .000, partial eta squared = .35] that accounted for a medium amount of the variance (35%), and for distraction [Wilkes Lambda = .63, F (3, 42) = 8.22, p = .000, partial eta squared = .37] that accounted for a medium amount of the variance (37%), (all other ps > .12).

Results Summary

The results demonstrated that the self-criticism significantly increased distress for all four conditions after both exposures. Thereafter, there were significant changes across time in all three dependent variables across all four conditions, although no significant effect was recorded for the condition or interaction effects. Interestingly, there was a significant decrease in AAQ scores for the two hierarchical conditions, but not for the two distinction conditions. The results from the RQ demonstrated significant effects for time in believability,

vividness, guilt and distraction, although the condition or interaction effects were not significant.

Discussion

The findings from Experiments 9 and 10 demonstrated the utility of the self-criticism task as a method of experimental distress induction and the fact that it appeared to lend itself well to the inclusion of brief therapeutic analogue components. The current procedure was, of course, selected because it was deemed to be more ACT-consistent, hence potentially more conducive to manipulation by ACT components. This feature offered the possibility of recording positive outcomes for ACT components in distress reduction which had not been recorded in Experiments 2-5 using the single-sentence paradigm.

Experiments 9 and 10 were also concerned with exploring the potential conceptual overlap between relational frames and self as context. In short, we asked whether targeting specific relational frames within our interventions would potentially enhance outcomes for self as context techniques. Doing so might also provide some insight into the verbal relational processes that underpin ACT's middle level concepts, such as self as context.

The results for both studies demonstrated that the self-criticism task not only successfully allowed the inclusion of self as context interventions, but also allowed us to parse out those that targeted hierarchical vs. distinction relations. Indeed, the data from both experiments consistently showed superiority for the hierarchical interventions and the benefits of these interventions even extended to reductions in avoidance, as measured on the AAQ. Overall, these findings attested to the robustness and utility of the self-criticism task in achieving the current experimental aims and are among the first to provide empirical evidence of the utility of using bottom-up RFT concepts to account for ACT middle level

concepts. These issues will be explored in greater detail in the General Discussion chapter that follows.

Chapter 6
General Discussion

General Discussion

The current programme of research had four main aims. 1. Our primary *methodological* concern involved experimental emotional distress induction procedures, which were employed across all ten experiments. Specifically, we wanted to find an experimental preparation that would lend itself to the exploration of brief analogue therapeutic interventions with non-clinical samples. Experiment 1 compared two existing and almost identical procedures. One of which was used again in Experiments 2-5. A third procedure was then investigated in Experiments 6-10. 2. Our primary *intervention* concern involved brief analogues of self as context exercises derived from ACT. Specifically, we were concerned with the potential for a focus on self as context to enhance the distress reduction observed with other ACT-related analogue interventions. 3. Our secondary intervention concern involved selecting a range of core ACT hexaflex processes and evaluating their distress reduction potential. This was the focus of Experiments 2-5. 4. Our tertiary intervention concern sought to explore the relationship between self as context and mindfulness. These interventions were investigated across Experiments 6-8. 5. A broad *conceptual* concern centred on the potential for RFT-based concepts to provide functional accounts of ACT's middle level terms. Based upon this, Experiments 9 and 10 sought to manipulate perspective-taking, distinction and hierarchical relations within self as context exercises.

Summary of Chapter 2 (Experiment 1)

On the path towards identifying a method of emotional distress induction that would potentially lend itself to the exploration of brief analogue therapeutic interventions, we selected a procedure by Rachman et al. (1996). This simply required participants to write a

single-sentence about the hypothetical involvement of a loved one in a road traffic accident. Although widely used, and with established success in the induction of self-reported emotional distress, no published studies show any comparisons with other procedures. Hence, Experiment 1 systematically compared this with an adaptation of a short defusion-based intervention from ACT, widely used in experiential exercises and also involving a hypothetical accident. The simple methodological question concerned which procedure (single-sentence vs. multi-sentence) would generate the larger increases in subjective distress in an undergraduate non-clinical sample. Based on the view that the longer manipulation might generate greater vividness of (and thus distress associated with) the imagined scene, we hypothesised that this would generate larger increases in the dependent measures of discomfort, anxiety and stress. However, this hypothesis was not borne out and both procedures significantly and similarly increased distress on all three subjective measures.

In order to ascertain whether any potential differential impact of the interventions was mediated through vividness, for example, we developed the Reactions Questionnaire (RQ) to explore a range of participant reactions to the imagined scenario. Although the two procedures were equally effective in increasing distress, participants reported different reactions to them. Specifically, the multi-sentence procedure showed: significantly higher willingness to engage with thoughts; significantly greater vividness of these thoughts; and higher believability (this difference was not significant). In contract, guilt and moral wrongness were higher for the single-sentence condition, although this difference was not significant.

Issues Raised by Chapter 2

The existing literature contains a range of experimental distress induction procedures that differ primarily in terms of the stimuli or situations used to evoke affect and/or the types of responses measured (e.g. physiological, subjective, etc.). One short and easy-to-use procedure that appears to have good *subjective* effects with largely non-clinical samples is Rachman et al.'s (1996) single-sentence preparation. Because there appear to be no published studies that have systematically compared distress induction procedures, it is difficult to draw comparisons across studies. Furthermore, a wide variety of dependent variables has also been targeted. So, how do the current outcomes compare to other procedures?

In their original study, Rachman et al. (1996) reported that the single-sentence procedure increased subjective anxiety by as much as 53 points on a visual analogue scale (VAS), with a self-selected sample of undergraduates categorised as high in thought action frequency (TAF). Perhaps less impressive, but still positive, outcomes have been reported by other authors using the same procedure with random samples of undergraduates. Specifically, Bocci and Gordon (2007), van den Hout et al. (2002) and Zucker et al. (2002) reported mean increases in anxiety of 36, 29 and 27 VAS points, respectively. On the whole, the latter are more consistent with our findings with a random sample of undergraduates from Experiment 1, in which both the single-sentence and multi-sentence procedures generated a mean increase in anxiety of 21 points on the VAS. Similarly, Kehoe et al. (in press) reported a mean anxiety level of 26/100 at post-induction, using radiant heat induction with a non-clinical sample of undergraduates. Furthermore, these outcomes are also similar to those reported with the CO_2 challenge. Specifically, Levitt et al. (2004) found that this procedure increased anxiety in a clinical sample of persons with panic disorder and recorded a rating of approx. 40 (using conversion from a Likert scale) after a CO_2 challenge.

Only one other study by Kehoe et al. (in press) appears to have recorded subjective *discomfort*. The mean discomfort ratings recorded for both procedures in Experiment 1 were between 7 and 10 at baseline and these increased to 29 at post-induction. This yielded an increase of between 19 and 22 points on the discomfort VAS across the two procedures. While Kehoe et al. did not record baseline discomfort, their mean discomfort level at post-induction was 55/100, somewhat higher than that recorded here. However, it is worth considering that this difference may be accounted for in part by the possibility that participants in the heat induction study interpreted discomfort in that context as physical. Indeed, the instructions provided to participants with the radiant heat apparatus advised them to keep their fingers on the heat pad to the point at which it becomes intolerable. As a result, it seems likely that a physical pain induction procedure such as this would generate higher 'discomfort' ratings than a more emotionally-based procedure could hope to achieve.

Support for this type of suggestion also comes from comparisons of the current subjective *stress* outcomes with other research. Only one other study by Karekla, Forsyth and Kelly (2004) appears to have recorded subjective stress. The mean ratings recorded for both procedures in Experiment 1 were 7-8 at baseline and 23-24 at post-induction. This yielded an increase of 14-16 points on the stress VAS across the two procedures. Again, this is considerably lower than the findings reported by Karekla et al. who found that the CO_2 challenge increased stress by 36 points in a non-clinical sample. Once again, 'stress' is perhaps a more apt descriptor for the impact of the CO_2 challenge than for the current emotional procedures and this likely accounts for the sizeable difference in outcomes on that dependent measure.

A central hypothesis of Experiment 1 was that distress induction would be greater in the multi-sentence procedure, possibly because it would generate greater vividness of the imagined scene. Controlling for these potential mediating effects was the primary purpose of

the RQ. Although no differences emerged between subjective outcomes with the two procedures, the RQ data did indicate that the mean vividness rating was significantly greater (52/100) in the multi-sentence than in the single-sentence (30/100) procedure. Hence, the longer manipulation did, as predicted, generate greater vividness, but contrary to our prediction, this had little or no effect on distress induction.

Interestingly, even the larger vividness outcome recorded on the multi-sentence condition here (i.e. 52) was smaller than that recorded by Marcks and Woods (2007) on the single-sentence manipulation (i.e. 69/100). Indeed, the vividness outcome for our single-sentence condition (i.e. 27) was nearly three times smaller than the figure reported by those authors. Furthermore, Marcks and Woods also reported high levels of willingness (66/100) compared to ours (i.e. 30-52). Taking the two strong outcomes for vividness and willingness recorded by these authors, one might suggest that better willingness with the task facilitates greater vividness.

The outcome on believability of the scene also suggests a potential relationship between vividness and believability both for us and previous researchers. Specifically, the mean believability rating was almost significantly greater in the multi-sentence condition (36/100) than in single-sentence (25/100). Hence, one might suggest that the greater vividness associated with more sentences also increased the believability of the scenario. This relationship between vividness and believability is again supported by Marcks and Wood (2007), who, in conjunction with very high vividness (69/100) also recorded high believability (66/100).

Rachman et al. (1996) proposed that the presence of negative feelings, such as guilt and moral wrongness, may also be critical to attaining increases in distress using the emotionally-based single-sentence procedure. This view is supported by the current RQ data for both guilt and moral wrongness. Indeed, both procedures employed in Experiment 1

generated considerable guilt (42-52/100) and moral wrongness (48-60/100). These outcomes are also consistent with other studies. Specifically, the guilt outcomes recorded here were very similar to those reported by Rachman et al. (54/100), Zucker et al. (2002; 58/100) and Marcks and Woods (2007; 43/100). The current moral wrongness outcomes (48-60/100) were also consistent with Marcks and Woods (43/100) and Zucker et al. (52/100).

Interestingly, all of these outcomes recorded in other research were obtained with the single-sentence preparation. And the current data indicated that this manipulation was associated with greater guilt (52 vs. 42/100) and greater moral wrongness (60 vs. 48/100) than the longer manipulation, however these differences were not significant. These current differences suggest one reason why the multi-sentence condition is no more effective than the shorter single-sentence manipulation in the reduction of distress. That is, perhaps the longer manipulation begins to reduce feelings of guilt and moral wrongness (or generally negative feelings) and thus facilitates habituation to distress, which in turn may undermine its potential superiority in outcome, which might otherwise be assisted through greater vividness, willingness and believability. In any case, the current findings and their concordance with other published evidence, support the proposition by Rachman et al. (1996) that negative appraisals such as guilt and moral wrongness play a key role in the impact of the single-sentence (and perhaps other) distress induction procedures.

Summary of Chapter 3 (Experiments 2-5)

The general aim of Experiments 2-5 was to compare the relative impact of brief analogue ACT interventions on experimentally induced distress generated by the single-sentence procedure. In simple terms, we reasoned that if, as suggested by the hexaflex, self as context is pivotal to other ACT processes, distress outcomes associated with ACT interventions would likely be enhanced by the addition of a self as context component.

Specifically, we asked if interventions based on acceptance, defusion, values and contact with the present moment would successfully reduce experimentally induced distress and if so, could these effects be enhanced by adding a self as context intervention? In order to facilitate better comparisons of the four ACT interventions, we investigated all using an identical experimental design. Furthermore, given that the results from Experiment 1 showed no superiority of the longer multi-sentence distress induction procedure over Rachman et al.'s (1996) single-sentence paradigm, we chose the latter shorter methodology as our focus for these comparisons.

Experiment 2. The primary aim of Experiment 2 was to systematically compare the potential for a brief *acceptance*-based intervention vs. an identical but *self-enhanced* acceptance intervention to reduce subjective experimentally induced distress. Based on the hexaflex, we predicted that the self-enhanced acceptance condition would show greater efficacy than the acceptance condition alone in reducing discomfort, anxiety and stress. However, the primary outcomes did not support this prediction and both interventions demonstrated little or no beneficial effects in any regard. While some non-significant reductions in discomfort, anxiety and stress were observed in the self-enhanced condition (but not in the acceptance condition), all three dependent variables remained higher than baseline at post-intervention for both conditions. At post-intervention, the values condition increased willingness, while self-enhanced values decreased it. Believability and vividness decreased for values and increased for self-enhanced values. Guilt and moral wrongness decreased in both conditions and distraction increased in both conditions. None of these changes for the RQ were significant.

Experiment 3. The primary aim of Experiment 3 was to systematically compare the potential for a brief *defusion*-based intervention vs. an identical but self-enhanced defusion intervention to reduce subjective distress. Again, we predicted that the self-enhanced

condition would show greater efficacy than the defusion condition alone. Again however, the primary outcomes did not support this prediction and both interventions demonstrated even poorer effects than the acceptance-based interventions from Experiment 1. That is, discomfort and anxiety *increased* after the self-enhanced defusion intervention. These changes were not significant. After the defusion alone intervention discomfort and anxiety remained unchanged. However there was a significant increases in stress for all participants at this point. The RQ data demonstrated that the defusion condition decreased willingness and vividness non-significantly, while self-enhanced defusion increased both non-significantly. Both conditions increased guilt non-significantly and believability significantly. Defusion increased moral wrongness, while self-enhanced defusion decreased it. Both these changes were non-significant.

Experiment 4. The primary aim of Experiment 4 was to systematically compare a brief *values*-based intervention vs. a self-enhanced values intervention. Again, we predicted that the self-enhanced condition would show greater efficacy in reducing distress. Again however, the primary outcomes did not support this prediction. Indeed, although all changes in discomfort and anxiety were minimal and non-significant, there was superiority for the values alone intervention in reducing stress compared to the self-enhanced condition which actually increased it. In general, the RQ data showed that the values condition increased willingness, believability and guilt non-significantly while the self-enhanced values condition decreased these non-significantly. Vividness decreased for values and increased for self-enhanced values. There was a significant increase in distraction for both conditions. Moral wrongness decreased significantly in both conditions.

Experiment 5. The primary aim of Experiment 5 was to systematically compare a brief *contact with the present moment* intervention vs. a self-enhanced contact intervention. Again, we predicted that the self-enhanced condition would show greater efficacy in reducing

distress. Again however, the primary outcomes did not support this prediction and the outcomes for both interventions were weak and variable. Specifically, both conditions showed small and non-significant decreases in discomfort. The contact alone intervention decreased anxiety, but increased stress, while self-enhanced contact increased anxiety and decreased stress. None of these changes were significant. The RQ data demonstrated that guilt, moral wrongness and distraction decreased non-significantly for both conditions. In contrast, the self-enhanced contact condition increased willingness, vividness and believability while the contact condition decreased these and these changes were not significant.

Issues Raised by Chapter 3

Across Experiments 2-5, all four brief analogue interventions (acceptance, defusion, values and contact with the present moment) failed to significantly, or even reliably, reduce discomfort, anxiety, or stress to near baseline levels. (We will deal with the outcomes of the related self as context interventions in the section below which discusses broader theoretical issues raised by the thesis). Collectively, all four stand-alone conditions comprised of 45 participants and the consistency of data across them is remarkable. Taken together, the findings are, at one level, inconsistent with ACT and indicate that none of the target interventions appeared to facilitate the separation of participants' from their negative content associated with the distress induction manipulation.

Only a limited number of published studies have investigated therapeutic components of the hexaflex with experimental preparations *other than* distress induction and these have focused only on acceptance and/or values. Among these, several have shown positive outcomes for *acceptance* in terms of reductions in level of chronic pain and associated distress in a sample of individuals diagnosed with chronic pain (McCracken, 1998;

McCracken, Spertus, Janeck, Sinclair, & Wetzel, 1999; Summers, Rapoff, Varghase, Porter, & Palmer, 1991). Similar research by Jacob, Kerns, Rosenberg and Haythornthwaite (1993) also found that sufferers who accepted their pain showed less overt pain behaviour and depression. Exploring the use of acceptance in an organisational context, Bond and Bunce (2003) reported that levels of acceptance predicted mental health and job satisfaction. Even more broadly, Butler and Ciarrochi (2007) demonstrated that greater psychological acceptance was associated with better quality of life in terms of: health; safety; sense of community; and emotional well-being.

Similarly positive outcomes have been recorded for *values* interventions. Specifically, Creswell et al. (2005) found that values clarification exercises were associated with significantly lower cortisol responses to stress than controls. Sheldon, Kasser, Smith and Share (2002) found that lifelong goal pursuit correlated with better psychological and physical health throughout life. And, even brief values writing exercises have been shown to increase school performance in stigmatised minority students (Cohen, Garcia, Apfel, & Master, 2006) and to improve reactions to health messages (Harris & Napper, 2005). The experimental design of these studies does not permit sound comparisons with Experiments 2 (acceptance) and 4 (values) currently. However, the poor results recorded here are generally not consistent with the strong and positive published outcomes at least with regard to acceptance and values.

A review of the published evidence for these components when combined with experimental distress induction procedures likely affords a better comparison with current outcomes. Gutierrez et al. (2004) reported that *acceptance* resulted in a significant increase in pain tolerance with brief electric shock apparatus, but these authors did not include subjective measures similar to ours. Hayes, Bisset et al. (1999) also reported positive outcomes for acceptance in terms of longest immersion time in the cold pressor task. This study did use

subjective measures and found that both discomfort and believability decreased by 12 and 8 VAS points, respectively. These outcomes differ from Experiment 2 here which found that discomfort did not change after exposure to the acceptance intervention. However, our believability data from Experiment 2 concords with Hayes et al. in showing decreases in belief of 10 VAS points. Kehoe (2008) explored acceptance with radiant heat induction presented to undergraduates. Again, acceptance significantly increased pain tolerance, but there was no change in either anxiety or discomfort. These findings are consistent with the results from Experiment 2, although it is worth noting that the mean discomfort rating reported by Kehoe was approximately twice as high (60 vs. 32) than that recorded here. Taken together, these outcomes perhaps support the suggestion made above that brief acceptance interventions are more beneficial in a context of physical rather than emotional distress when induced experimentally.

Masuda et al. (2004) attempted to investigate the utility of a brief *defusion* technique (based on word repetitions) in the context of a self-criticism task presented to undergraduates and similar to that employed in Experiments 6-10. They reported that defusion reduced both believability and subjective distress. In a similar study, Healy et al. (2008) also found that defusion decreased discomfort and increased willingness, but also increased believability. Again however, it is worth noting that their mean believability rating was considerably higher than that recorded in Experiment 3 (85 vs. 58). Taken together, these two published outcomes showed stronger defusion effects than current findings, even though all three studies employed a somewhat similar emotional distress induction procedure.

Only one published study by Paez-Blarrina et al. (2008a) appears to have explored the utility of a *values* intervention (independently of other ACT components) in the context of distress induction. These researchers found that values increased task persistence, but no subjective measures were recorded.

In addition to comparing the findings from Experiments 2-5 with published evidence (with and without the use of distress induction procedures), it also seemed worthwhile to compare the outcomes we observed across our four separate ACT processes to determine which was the most effective at reducing distress. In Figures 37-39 we compared all four stand alone interventions (acceptance, defusion, values and contact with the present moment) in the reduction of discomfort, anxiety and stress (i.e. one graph per measure).

There were some notable differences among conditions in changing discomfort (see Figure 37). That is, the contact and defusion exercises *decreased* discomfort (but not to near baseline levels), while values and acceptance *increased* discomfort. However, results from a 3x4 ANOVA demonstrated that although the effect for time was significant ($p = .00$), condition and the interaction were not (both $ps > .86$).

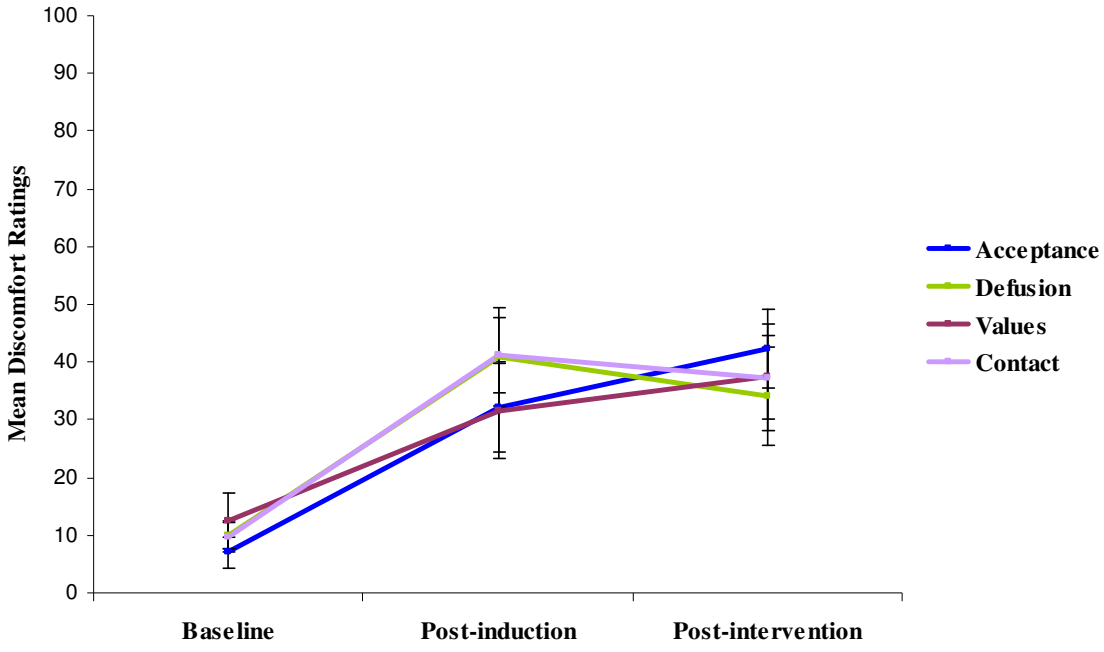

Figure 37. Mean discomfort ratings across time for the four stand alone interventions in Experiments 2-5.

There were also notable differences among conditions in changing anxiety (see Figure 38). On this occasion, the contact and acceptance exercises *decreased* anxiety (only marginally), while values and defusion *increased* anxiety. Again, a 3x4 ANOVA demonstrated that the effect for time was significant (p = .00), but condition and the interaction were not (both ps > .65).

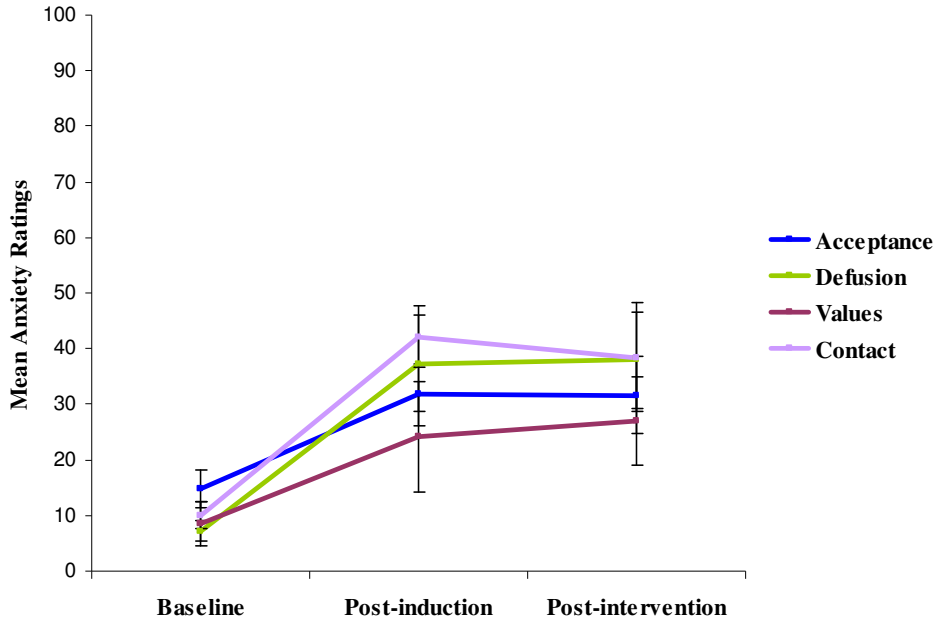

Figure 38. Mean anxiety ratings across time for the four stand alone interventions in Experiments 2-5.

There were notable differences among conditions in changing stress also (see Figure 39). In this case, only the values exercise *decreased* stress and did so to close to the baseline level. The acceptance exercise resulted in no change in stress, while contact and defusion *increased* stress. Again, a 3x4 ANOVA demonstrated that the effect for time was significant (p = .004), but condition and the interaction were not (both ps > .54).

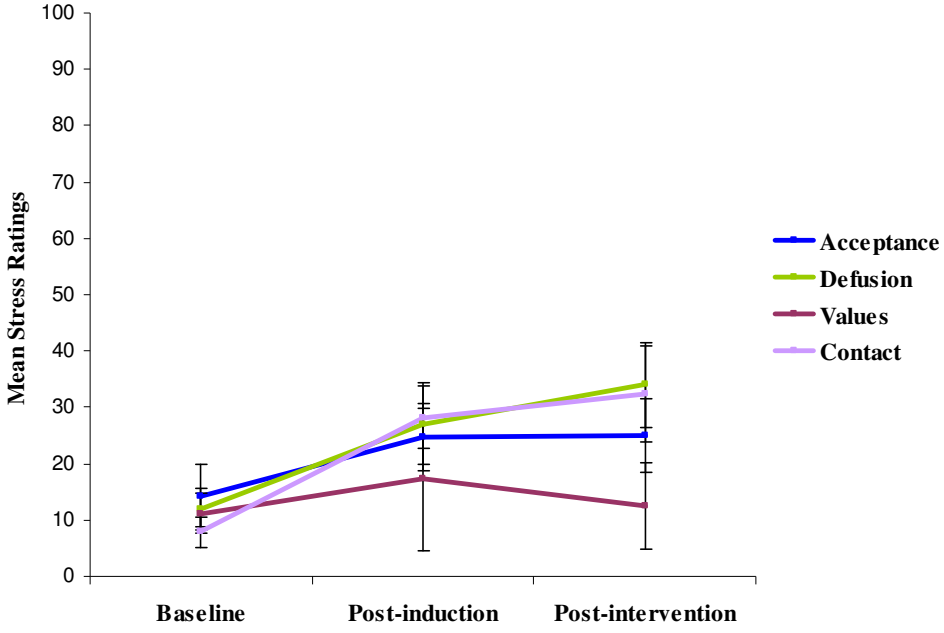

Figure 39. Mean stress ratings across time for the four stand alone interventions in Experiments 2-5.

Although one cannot assume that the lack of effects for all interventions resulted from the same process (or lack thereof), it is perhaps safe to say that participants showed little or no defusion from the emotional content associated with the hypothetical accident (not even in the defusion intervention). This is based on the assumption that had defusion taken place there would likely have been some decrease in subjective distress. In defence, however, one could not also assume that participants showed little acceptance, values, or contact with the present moment. From an ACT perspective, one might indeed argue that if participants are encouraged to accept such content or make contact with it in the present then distress might be expected to *increase*, rather than decrease. The difficulty with this proposition, however, rests on the fact that no consistent or significant changes *in any direction* were recorded. The appropriateness of using ACT-based analogue interventions to reduce emotional discomfort is discussed further in the section below which explores broader theoretical issues raised by the thesis.

Summary of Chapter 4 (Experiments 6-8)

Chapter 4 included Experiments 6-8 which comprised of empirical analyses of the utility and role of mindfulness in distress reduction using a new more ACT-related experimental preparation. This simply asked participants to present a self-criticism which caused them distress (Masuda et al., 2004). Although, the use of this alternative procedure was in part designed to rectify the high drop-out rates (approx. 10% of overall participants) of the previous experiments (primarily due to the large numbers of participants with previous experience of motor accidents), it also served to provide a distress induction procedure that might yield better to brief ACT-based analogue interventions.

Experiment 6. The aim of Experiment 6 was to explore the potential functional distinction (or overlap) between self as context and mindfulness. While the same self as context intervention as Experiments 2-5 was employed here, it was now compared to a mindfulness exercise taken from the Mindfulness-Based Stress Reduction (MBSR) programme. Based on the little beneficial effects of the interventions in Experiments 2-5 we decided to stop making specific predictions at this point.

We chose to conduct the specific comparison between self as context and mindfulness because although elements of both types of interventions require participants to focus on aspects of themselves, they are nonetheless distinct in the nature of *what* is focused upon. That is, self as context techniques encourage a focus on psychological events, such as thoughts, while mindfulness techniques encourage a focus on somatic events (i.e. the body). Hence, comparing the two would perhaps allow us to determine whether it is the self-focus per se or the target of this focus that facilitates distress reduction.

While developing the rationale above, we also reasoned about the possibility that there may be a difference between the acts of focusing on content that pertained to the self (either psychologically or physically) vs. a more simplified self-focus. Hence, in Experiment

6, we introduced a third condition to address this issue. That is, we included a self-focus condition in which participants were required to answer a series of questions about themselves while being audio-taped. They subsequently listened back to their own voice as the audio-recording was replayed. This provided a self-focus but not one that directed participants towards their psychological or somatic content.

The results demonstrated significant increases in discomfort, anxiety and stress at post-induction and thus indicated that the new experimental procedure was a viable means of inducing subjective emotional distress. Furthermore, both self as context and mindfulness interventions reduced discomfort, anxiety and stress. Although the self-focus condition generated a small reduction in discomfort, it actually *increased* both anxiety and stress, albeit marginally. The RQ data showed some further differences among conditions. Specifically, willingness decreased in mindfulness, while self-focus and self as context showed little change. Believability decreased in all three conditions, with the biggest decrease in mindfulness. Vividness remained stable for self as context and self-focus while there was a strong decrease for mindfulness. Distraction decreased for mindfulness and self-focus but increased for self as context. Guilt decreased in self as context and mindfulness (although it was moderately bigger in the latter), but increased marginally in self-focus.

Experiment 7. Experiment 7 adopted a more specific focus on mindfulness and attempted to determine the relative effects of focusing mindfully on physical sensations *or* on thoughts. Although the data from Experiment 6 indicated no such difference, it remained possible that when both components are presented within the same therapeutic format (i.e. both as mindfulness), some difference might emerge. For this distinction, mindfulness was differentiated into two techniques, referred to as *physical* mindfulness and *verbal* mindfulness. We then compared their relative utility in reducing distress generated by the same induction procedure from Experiment 6.

Although there was again a significant increase in discomfort and anxiety at post-induction, the increase in stress ratings on this occasion was not significant. Thereafter, both interventions significantly reduced all three dependent measures. The RQ data demonstrated that both conditions decreased believability, vividness, guilt and distraction. Willingness decreased for physical mindfulness and increased for verbal mindfulness.

Experiment 8. While both mindfulness interventions from Experiment 7 appeared to be equally effective at reducing subjective distress, we then considered the possibility that *combining* both elements would enhance the effects. However, exploring this possibility raised the question of whether the sequencing of the two components might influence the outcome. For example, mindfulness programmes (e.g. MBCT) always train participants to focus on physical events *before* focusing on psychological events. Hence, we wondered if this specific sequencing of the two components (i.e. physical mindfulness followed by verbal mindfulness) would be more effective than the reverse (i.e. verbal mindfulness followed by physical mindfulness).

In Experiment 8, the self-criticism task once again significantly increased all three dependent measures. Both conditions reduced discomfort and anxiety, but did not do so significantly and the conditions did not differ in either regard. While both also reduced stress, the physical-verbal mindfulness condition was significantly better than the verbal-physical condition. The RQ data showed that both conditions decreased willingness, believability, vividness, guilt and distraction.

Issues Raised by Chapter 4

Numerous authors (e.g. Cardaciotto et al., 2008) have highlighted overlaps between ACT and mindfulness, and the most common among these is reliance by both traditions on the utility and centrality of acceptance of one's somatic and psychological content (Hayes et

al., 1999; Kabat-Zinn, 2004). In contrast, however, each of these respective traditions at times appears to adopt a different perspective with regard to the role and importance of the self. For example, some aspects of the mindfulness tradition are silent on the issue of self (Kabat-Zinn, 1994), while other traditions propose that the verbal self must be targeted and its power and influence decreased (Hayes, 1995). As a result, mindfulness techniques vary widely on the extent to which they focus explicitly on self. One might, nonetheless, argue that even if self is *implicit* in mindfulness (given that most of the techniques are actually self-focused), then it is reasonable to assume that outcomes are potentially influenced by this variable. Experiments 6-8 were designed to explore this and related issues concerning why mindfulness might have the effects it does.

The results from Experiment 6 showed that self as context and mindfulness were equally effective in distress reduction. There are little available studies to compare our results with, as the literature generally assumes that mindfulness sits within the ACT model and thus it is not necessary to compare each individual component. Only one previous study by Wilson (2009) investigated the effects of mindfulness and acceptance strategies for reducing anxiety associated with an academic test in a non-clinical sample and found that both demonstrated similar efficacy. These results are consistent with those obtained in Experiment 6. While this concord of evidence is good news for both mindfulness and self as context interventions, it again raises questions about the extent to which mindfulness and self as context share, as ACT clinicians argue, the same basic process. Even if one supports this view, the question about what precisely this shared process is comes into view. Unfortunately the fact that all of these concepts are middle level terms makes identification of one such process extremely difficult in an experimental context.

Experiments 7 and 8 did, in some way, tackle this issue by taking the mindfulness exercise from Experiment 6 and separating it into two experimental components of physical

vs. verbal focus. At the very least the results from Experiment 8 demonstrate that these exercises are better combined rather than given as stand alone techniques. And this is consistent with the data from contemporary mindfulness therapeutic packages like MBSR and MBCT where mindfulness skills are cultivated in a combination of ways. The current physical-verbal sequence (which was significantly better at reducing stress than the verbal-physical sequence) parallels with the sequence in MBSR where cultivating awareness of bodily sensations through the Body Scan exercise is the first skill participants are required to learn. This skill is then sharpened and applied to problematic psychological content such as worrisome thoughts. However, much more empirical work is needed to parse out the relationship between these two mindfulness components and to explore the overlap with other ACT processes.

Summary of Chapter 5 (Experiments 9-10)

Chapter 5 included Experiments 9 and 10 which comprised of empirical analyses of the utility of hierarchical and distinction relations in ACT techniques in distress reduction using the same experimental preparation as Experiments 6-8.

Experiment 9. Experiment 9 employed two brief self as context interventions with a non-clinical sample of undergraduates, presented in the context of the self-criticism task. Although the interventions employed were broadly similar to the self as context exercises we had employed previously in Experiments 2-6, Experiment 9 used abbreviations of other self as context interventions developed by Luciano et al. (2011). The main reason for using these modified interventions was to enable us to emphasise specific relations within the techniques and to some extent to be able to draw clear comparisons between our data and those reported by Luciano et al. Specifically, one self as context intervention explicitly emphasised the *distinction* between self and content, while the other explicitly emphasised a *hierarchical*

relation between these to explore the potential role of the deictic relations in self as context techniques.

Some differences were recorded between the two interventions in terms of their efficacy in reducing the dependent measures. Specifically, while the distinction intervention did not reduce discomfort or anxiety, the hierarchical intervention reduced both. In contrast, while the hierarchical intervention significantly reduced stress, the distinction intervention significantly *increased* it. Outcomes on the RQ demonstrated that both conditions increased willingness but decreased believability, vividness, guilt and distraction.

Experiment 10. Experiment 10 attempted to further explore the relative utility of distinction vs. hierarchical relations in self as context interventions, using the same self-criticism task as previous experiments. However, a second aspect of the research examined the extent to which a focus on the self potentially played a role in the outcomes described above. Specifically, Experiment 10 compared interventions that focused on participants' thoughts about the self-criticism (i.e. self-focused) vs. interventions that focused on thoughts about an inanimate object (i.e. object-focused). In short, participants in both groups were asked to focus on thoughts, but only in the self-focused interventions did they focus on thoughts about themselves. This manipulation sought to determine the extent to which a focus on self-specific content affected the utility of the intervention. Within each of these two pairs of conditions, the experimental design also sought to manipulate the relational nature of this distancing, through which distinction or hierarchy relations were specifically targeted. Hence, this created four conditions in total, two self-focused (self hierarchy and self distinction) and two object-focused (object hierarchy and object distinction).

The results demonstrated significant changes across time in all three dependent variables across all four conditions showing that there were little differences between the four conditions in terms of distress reduction. However, there was a significant decrease in AAQ

scores for the two hierarchical conditions (self hierarchy and object hierarchy), but not for the two distinction conditions. In addition the correlational data demonstrated superiority of both hierarchical interventions over distinction as a longer practice period for both object hierarchy and self hierarchy were associated with lower scores on the AAQ and lower distress. In addition, there were little differences between the utility of the object-focused vs. self-focused interventions. The results from the RQ demonstrated that at post-intervention I all conditions decreased believability, vividness, guilt and distraction. Willingness increased for self distinction, self hierarchy and object distinction at this point, while objective distinction decreased. At post-induction II, all conditions decreased willingness and believability, while all conditions increased vividness. Guilt increased for self distinction, self hierarchy and object distinction but decreased for object hierarchy. Distraction increased for self distinction, self hierarchy and object distinction, but it increased for object hierarchy. At post-intervention II, all conditions decreased believability, vividness, guilt and distraction. Self distinction, self hierarchy and object distinction increased willingness, while object hierarchy decreased it.

Issues Raised by Chapter 5

The integration of RFT and ACT is central to the CBS reticulated model and the programme of research it promotes and relies upon. In the General Introduction, we argued that the *third generation* of RFT research contained the beginnings of the integration of RFT and ACT through componential analyses and the application of RFT protocols to clinical samples. We also proposed that we are on the cusp of a *fourth generation* of RFT research that attempts to define concepts that are central to ACT in RFT terms. Experiments 9 and 10 were derived from this latter research endeavour and explored ways in which specific relations (e.g. hierarchical) may underpin ACT's self as context techniques.

In both Experiments 9 and 10, the hierarchical interventions resulted in a reduction in all three dependent measures, including a *significant* reduction in stress. Specifically, Experiment 9 reported only marginal superiority of the hierarchical intervention in reducing discomfort and anxiety, although the superiority was significant in reducing stress (stress actually increased in the distinction intervention). The data from Experiment 10 concord almost entirely with these outcomes. Specifically, Experiment 10 found little or no differences between the hierarchical and distinction interventions on discomfort and anxiety. However, similar to the findings reported in Experiment 9, Experiment 10 showed superiority for the hierarchical interventions with regard to stress. Specifically, both hierarchical interventions were associated with significant reductions in stress after both exposures to the intervention. In Experiment 10 this extensive outcome was superior overall to the distinction interventions which reduced stress after the first distress induction but did not do so significantly, although both did reduce stress significantly or near significantly after the second distress induction. In summary, the stress measure not only generated the most positive outcomes, but also parsed out the relative utility of the hierarchical vs. distinction interventions and found hierarchical to be superior.

Unlike Experiment 9, Experiment 10 incorporated a short practice period between exposures to further explore the relative benefits of the interventions across time. In doing so, Experiment 10 showed superiority for the hierarchical interventions on the two exposures to the AAQ. Specifically, the hierarchical interventions were associated with a significant reduction in AAQ means from before the first distress induction (baseline I) to after the practice period (baseline II), while the distinction interventions were not. In other words, only the hierarchical interventions significantly reduced emotional avoidance. While this finding enhances the benefits observed with the hierarchical interventions, it also points to some interaction between avoidance and reductions in stress. Although the current research does

not permit speculation about the nature of this relationship and we would not go as far as saying that avoidance *mediated* the outcomes even to some extent, the correlational data also support some relationship between these two variables. That is, in general, the AAQ correlated significantly with all three types of distress at all six time points at which the dependent variables were measured. Hence, the higher participants' AAQ scores, the higher their discomfort, anxiety and stress. Further research would be needed to specifically address this interesting relationship and to explore the possibility that avoidance mediates distress.

The follow-up feature of Experiment 10 permitted by the practice period also highlighted the superiority of the hierarchical interventions. Only these interventions, not distinction, showed a *significant* correlation between length of the practice period and level of distress in Stage 2. That is, the longer the interval between the stages, the lower the distress afterwards. Furthermore, object hierarchy was the only intervention that showed a *significant* correlation between length of the practice period and scores on the AAQ at baseline II. In other words, the longer the interval between stages, the lower the avoidance for this condition. The practice period data were also informative with regard to the superiority of the hierarchical interventions in indicating stronger correlations than distinction between practice amount and level of distress in Stage 2.

The superiority for the hierarchical conditions in Experiment 9 and 10 is consistent with Luciano et al (2011)'s data, in which the defusion II intervention resulted in a significant reduction in problematic behaviours, along with a significant increase in mindfulness and psychological flexibility for the high-risk adolescents. The *lack of* effect for the distinction intervention is also similar to the findings from Luciano et al. who reported only limited effects for defusion I. It is important to emphasise, however, that the distinction interventions in Experiment 10 did reduce stress (but not discomfort or anxiety) significantly or near significantly at post-intervention II. Furthermore, there were procedural differences between

Experiments 9 and 10, and the original (including differences in the length and focus of the interventions), which make drawing close comparisons somewhat difficult.

One methodological feature of the current study which differs from the original by Luciano et al. (2011) is the generation here of only one self-criticism as the distress induction procedure. In contrast, the original researchers required participants to generate *several* target thoughts and feelings as part of the intervention. At a methodological level, the distress induction procedure may be even more effective if several pieces or types of self-referential content were targeted. However, doing so may function as a type of exemplar training, which, in and of itself, potentially serves as an intervention. Again, future research might explore the potential utility of having multiple self-criticisms, while paying attention to their possible influence on selected interventions.

Broader Issues Pertaining to Experiments 1-10

Efficacy of self as context interventions. The role of self is explicit in the hexaflex via the term 'self as context'. However, the same term is, unfortunately, also used to describe therapeutic exercises that address this component. Although designated as an individual component process, self as context is deemed to be at the core of the hexaflex because it encompasses all other ACT processes. Specifically, self as context is said to encompass acceptance, defusion, values and contact with the present moment, because all five processes are necessary for the construction of a secure sense of self that is distinct from one's psychological content.

Experiment 6 contained the last use of the first type of self as context intervention we explored (i.e. the Observer exercise). Hence, there may be some utility in comparing the outcomes recorded across the five types of exposure to this intervention in Experiments 2-6. For illustrative purposes, the data from these are graphed in Figure 40 (N = 55). However, it

is important to draw attention to two caveats that pertain to this type of comparison. 1. In Experiments 2-5, the four self as context interventions were actually combined with the four target hexaflex processes. 2. The self as context intervention in Experiment 6 was delivered in conjunction with a different distress induction procedure than that employed in Experiments 2-5. Please also note that the strong similarity in outcomes associated with each of the five self as context interventions rendered it more feasible to employ one graph that presented discomfort, anxiety and stress, rather than three separate graphs as we generally employed thus far.

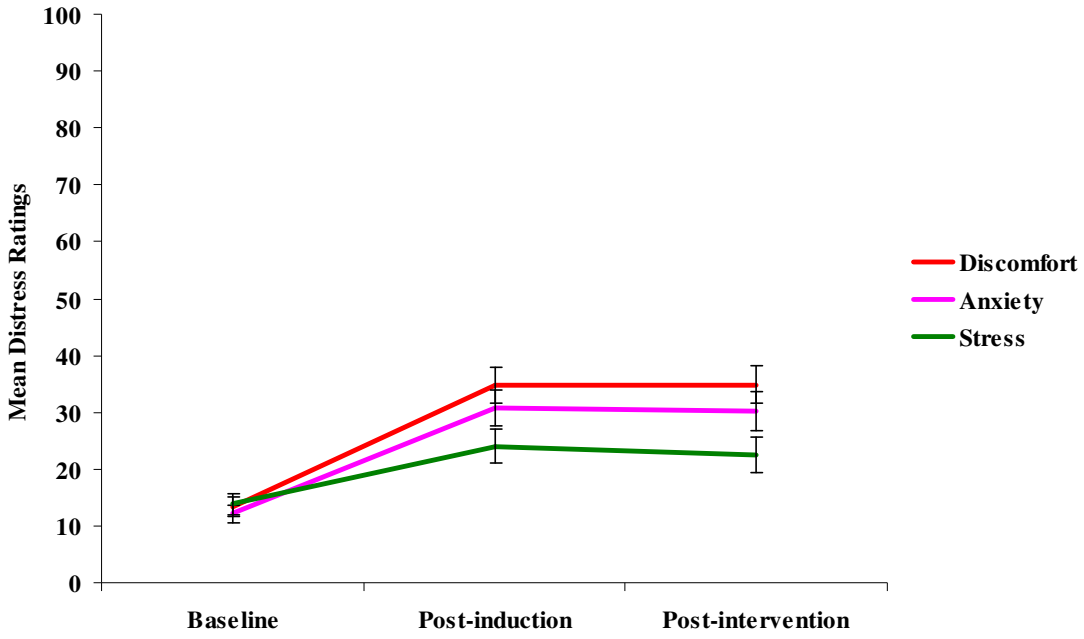

Figure 40. Mean distress ratings for all self as context interventions in Experiments 2-6.

Figure 40 clearly demonstrates a lack of efficacy for the self as context interventions on all three measures of distress. And as expected a series of paired samples t-tests confirmed that the ratings did not differ significantly from post-induction to post-intervention (all ps > .35). These poor outcomes do not concord with the only available published study that has highlighted self as context techniques as reported by Williams (2006). That is, although we found that self as context interventions were ineffective at reducing emotional distress,

Williams reported these techniques reduced symptoms of post traumatic stress disorder (PTSD) scale for war veterans.

A somewhat different experimental path was adapted in our investigations of self as context techniques in Experiments 9 and 10. And fortunately, these showed much more positive outcomes for the target self as context interventions than our previous attempts. Indeed in the later experiments the self as context interventions were generally effective in reducing subjective distress and the hierarchical interventions were distinctly successful. Although we are limited in drawing comparisons between the self as context outcomes in Experiments 2-5 (the single-sentence task) with those in Experiments 6, 9 and 10 (self-criticism task) because of methodological differences, the collective data and strong differences in outcomes still warrant some discretion about the role of self in these techniques.

We hoped that the unusual comparison between the self-focused and object-focused interventions in Experiment 10 would allow us to parse out whether what was actually been focused on was important, but the data suggested not. In other words, it did not matter whether participants focused on their own thoughts about the self-criticism directly or on thoughts about an inanimate object, distress went down in either case. In hindsight however, one might argue that in both cases participants are still focusing on their own thoughts, hence on themselves. As a result, in practice the object-focused interventions were no less focused on the self than the interventions we labelled as self-focused.

On balance, this short-coming is offset to some extent by the interesting outcomes we recorded for the hierarchical vs. distinction based self as context interventions. These quite successfully showed that establishing a hierarchical relationship between an individual and his/her psychological content is better at reducing distress than establishing a distinction relation between these two. Not only does this support our starting position that RFT may provide a useful inroad towards a better understanding of ACT's middle level terms, but it

also permits quite a fine grained analysis of the important relationship between one's self and one's content. The superiority not only of hierarchy over distinction but also of these later self as context interventions over our early endeavours suggest (as also suggested by Luciano et al., 2011) that this may be the most productive route into an empirical understanding and account of the benefits and processes of self as context.

A methodological issue. The results from Experiments 1-5 add to a large literature on the use of experimental distress induction procedures that include the cold pressor task, electric shock and radiant heat (e.g. Gutierrez et al., 2004; Hayes, Bisset et al., 1999; Kehoe et al., in press). Although, the Rachman et al's (1996) single-sentence paradigm is short, simplistic and requires no apparatus, it appeared to be an effective means of inducing distress. Furthermore, these features made it procedurally easy to co-ordinate the methodology with brief analogue interventions. The procedure's main drawbacks relate to its reliance on emotional rather than physical reactions, and thus on subjective self-report measures as dependent variables. But the extent to which these are actually problematic *relative* to other distress induction formats has not been explored in the literature. Suffice to say that the data indicated that in the current context this short distress induction procedure was effective in increasing participants' discomfort, anxiety and stress to levels at which the relative efficacy of brief interventions in reducing this elevated distress could then be investigated. On balance the high drop rates (approx 10%) associated with this distress induction task, due to the large number of participants who had previous related experience with car accidents, was both surprising and inconvenient. It is indeed something that researchers using this procedure should be aware of.

To address this and other ACT-based issues, Experiments 6-10 employed a different distress induction procedure. Indeed in the course of the thesis we employed three distress induction procedures overall: the single-sentence procedure; the multi-sentence procedure;

and the self-criticism task. Although it was not entirely our intention to explore such an array of procedures, doing so has nonetheless given us an opportunity to compare these in terms of their relative efficacy in inducing emotional distress. For illustrative purposes, we collated the data for each procedure and have represented this in Figures 41, 42 and 43 in terms of discomfort, anxiety and stress, respectively.

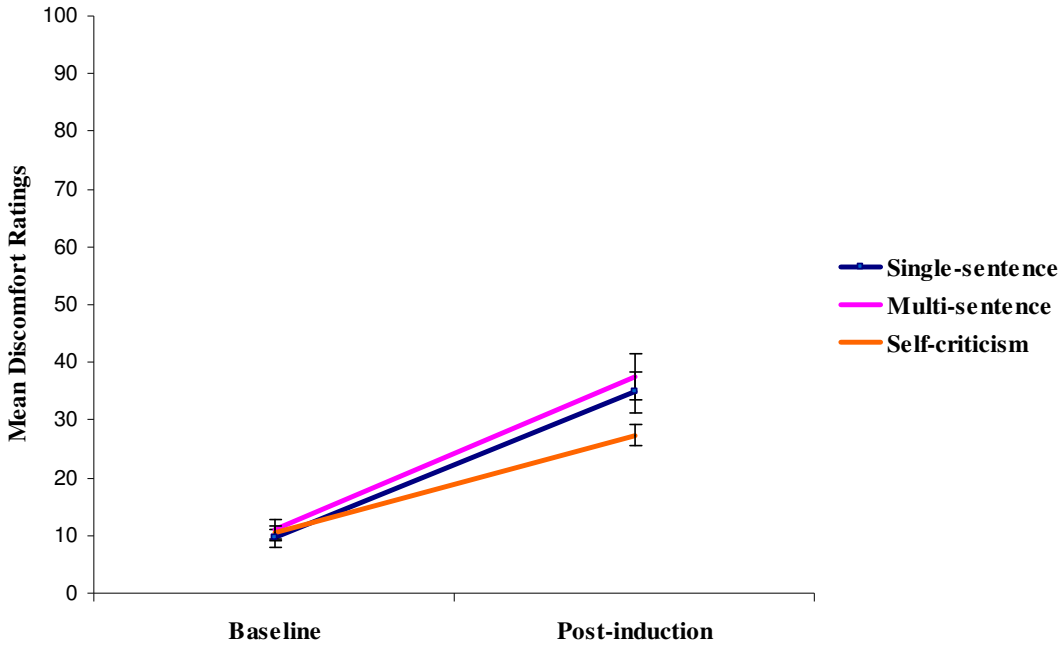

Figure 41. Mean discomfort ratings across time for all distress induction procedures in Experiments 1-10.

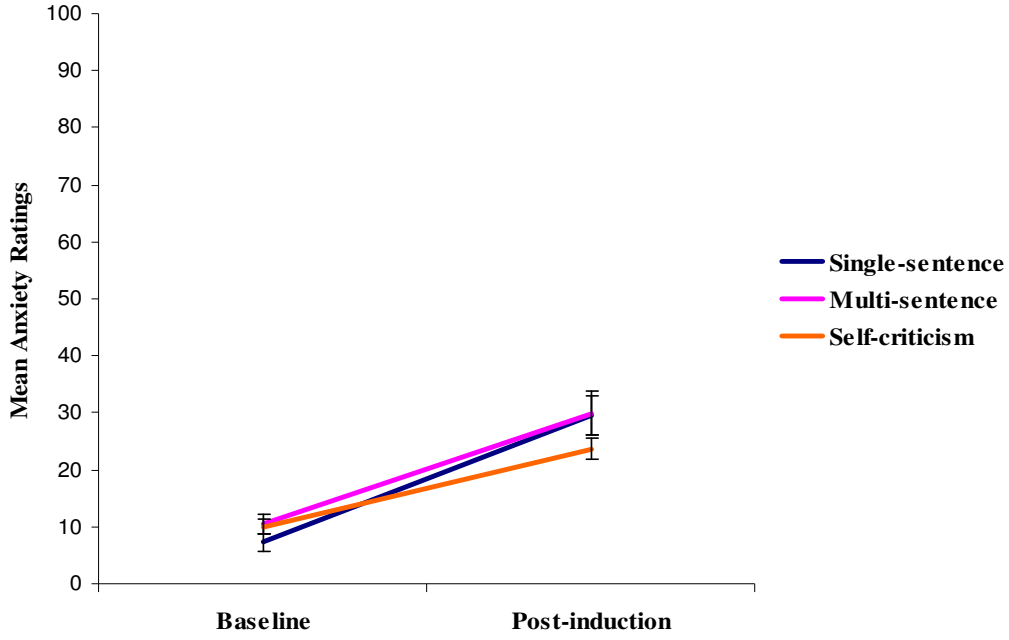

Figure 42. Mean anxiety ratings across time for all distress induction procedures in Experiments 1-10.

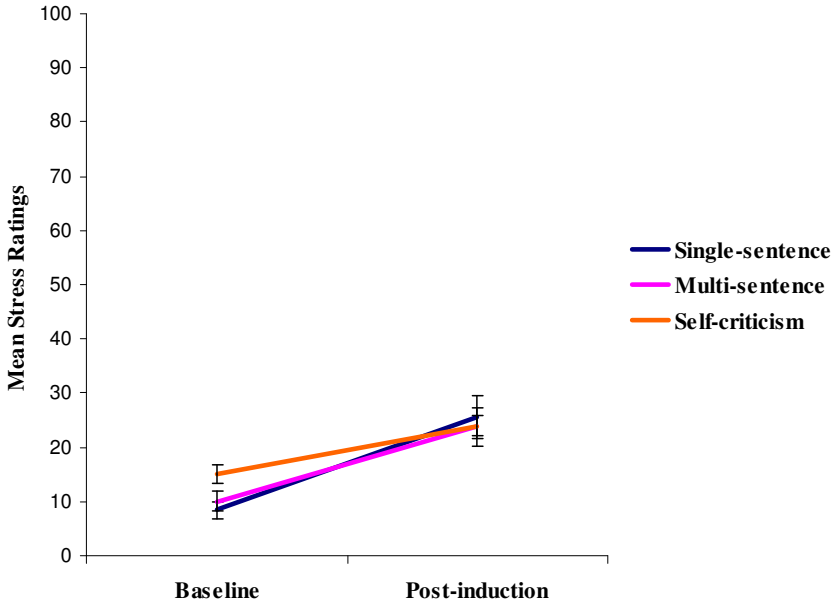

Figure 43. Mean stress ratings across time for all distress induction procedures in Experiments 1-10.

Figure 41 shows that all three procedures were effective in inducing emotional discomfort, although no one was more effective in this regard. Indeed a 3x3 ANOVA

demonstrated that the effect for time (p = .00) and the interaction effect (p = .01) were significant, although condition was not (p = .1).

Figure 42 again shows that all three procedures were effective in inducing emotional anxiety although no one was more effective in this regard. Indeed a 3x3 ANOVA demonstrated that the effect for time (p =.00) and the interaction effect (p = .04).

Figure 43 again shows that all three procedures were effective in inducing emotional stress although no one was more effective in this regard. Indeed a 3x3 ANOVA demonstrated that the effect for time (p =.00) and the interaction effect (p = .05) were significant, although condition was not (p = .57).

How appropriate is it to measure ACT outcomes as distress reduction? One might reasonably argue that attempts to alter emotional content are not applicable to ACT techniques, which by contrast foster valued action over changing emotional content. As a result, the lack of consistent changes in emotional content are in fact *consistent with* ACT. Of course, this issue cannot be resolved in the context of a distress induction paradigm, which is fundamentally based on manipulating self-reported emotional distress. However, we would argue that the distress induction procedure provided a robust experimental means of exploring the processes at work in manipulating emotional responding and an exploration of the possibility that whether it is intended or not, some of the benefits associated with ACT components may relate to their ability to reduce emotional distress. There remains only limited published evidence on individual ACT components and their relative efficacy and this type of componential analysis is best conducted with a tried-and-tested experimental preparation. It is also fair to say that there is at present only a very limited number of experimental preparations available that might be applicable to these empirical aims. The development of such procedures is a critical weakness in research efforts to subject middle level ACT processes to empirical and functional analyses.

Naturally, there is a range of methodological limitations within the current work, which have implications for future research. For example, the dependent variables chosen here may have limited applicability in an ACT context, whereas the use of a behavioural approach task may be a more appropriate outcome measure. For example, Kehoe et al. (in press) used radiant heat apparatus as the distress induction procedure and this allows amount of heat tolerance in time to be measured. Doing so circumvents the reliance on self-report measures and supplements the work with more direct measures of functional processes. Furthermore, the inclusion of a behavioural task allows for the collection of more robust follow-up data than subjective measures as taken at any one point in time. This, in turn, potentially demonstrates the stability and generalization of outcomes across time and is also a better analogue of what happens in a therapeutic context.

The stress measure. Interestingly subjective stress appeared to be the most malleable dependent measure throughout this programme of research. Indeed, in Experiment 8 the stress measure successfully separated the two mindfulness sequences and highlighted the superiority of physical-verbal mindfulness over verbal-physical mindfulness. In addition, Experiments 9 and 10 also showed significant reductions in stress for the hierarchical interventions, but not for distinction. One explanation for the sensitivity of the stress measure, relative to discomfort and anxiety, perhaps lies with the meaning of the word 'stress' for an undergraduate sample. That is, these participants may perceive of stress as more transient and less serious (e.g. a stressful day at college) than discomfort and anxiety and as a result it is more malleable through a brief intervention. These relative interpretations are not only a weakness that is hard to circumvent with subjective measures, but are also a potential factor when a non-clinical sample is brought into an experiment and asked to disclose something that is painful to them. In other words, it is highly unlikely that participants will disclose something that causes them persistent discomfort or anxiety, but may be more willing to

disclose something that is more transiently 'stressful' than anxiety-provoking or discomfort-inducing.

The issue of middle level terms. The current programme of research is among the first to attempt to target specific components of the ACT model and the functional elements of mindfulness and relational frames in the context of ACT exercises. In doing so, it fits the broader research agenda of scientific bridge building between ACT and RFT, while recognising the difficulties inherent in the use of middle level terms, such as self as context and defusion. Consider Experiments 9 and 10. One notable difference between these two studies and the original study presented by Luciano et al. (2001) concerned the terminology used to describe the core component shared by both interventions. That is, we conceptualised these as self as context-based interventions, while the original authors described these as defusion. The very fact that two sets of researchers can employ two different labels (that are distinguished as two separate hexaflex processes) for what is basically the same intervention indicates a lack of precision and functionality in these core processes. In the General Introduction, we described work which we have published in which we articulate the details and benefits of looking to RFT for an answer to these critical problems of definition.

On balance, it is important to emphasise that the concept of the three selves is no less of a middle level term than the concept of defusion, in the sense that it is not a laboratory identified process. And we recognise that there are limits to this type of translation exercise (or point-by-point mapping) in which ACT-based middle level terms are translated into RFT concepts. For us, the ultimate goal is to employ bottom-up RFT terms that will be subject to on-going scientific scrutiny and where possible and useful, to replace untestable middle level terms with these more basic and organic scientific processes. From that scientific perspective, only bottom-up functional behavioural processes are an acceptable unit of investigation and

analysis. While top-down concepts are pragmatically, heuristically and clinically useful, they have little or no scientific value.

One of the central ways forward in dealing with middle level terms is to replace them with more functionally sound, empirically tested concepts, such as replacing the terms self as context with distinction or hierarchical deictic relations. Although Experiments 9 and 10 are only one small step in that direction, the findings suggest that RFT concepts may have more clinical application than might have been previously recognised.

Concluding Comments. A strong aim in CBS is to explore the potential overlap between clinical and basic research concepts. Historically, the two broad pillars of CBS, namely ACT and RFT emerged in tandem but did not speak directly to one another. In simple terms, clinicians use language that serves clinical and therapeutic purposes, while researchers use language that is of largely scientific value. Indeed, this dissociation of clinical and basic research interests is not specific to CBS, but the organization is perhaps unusual in its focused efforts to integrate these two pillars. The current programme of research is in line with this bridge-building between the basic and applied nature of CBS and in particular is focused distinctly in its efforts on the role of self.

The hexaflex is a heuristic model of processes which to date have not been subject to functional analyses. If one was to start with a bottom-up analysis, there would be no hexaflex because such a model is top-down. If we start with a top-down model then the aim becomes about searching for functional analytic terms which might map onto those already present within the model. But this may be neither possible nor useful. For example, if existing processes turn out not to be functionally identifiable, then they would have to be abandoned. That is difficult to do once a model gets established in a verbal community, especially when this occurred in the absence of functional evidence. So, in a sense what we are trying to do in integrating RFT concepts into a top-down heuristic model is the mixing of two types of

analyses. However, if the hexaflex model is widely adhered to and understood by a specific verbal community, then perhaps the type of integration we present here is a good place to start.

There are obvious merits to reticulated models and indeed it is hard to see how to integrate clinical and basic research concepts in any other way without essentially becoming solely either top-down or bottom-up. Psychological traditions, on the whole, have not been particularly successful in this regard; hence it is hard to look for comparisons elsewhere. But, it is also difficult to see in advance what this reticulation of concepts will ultimately look like. For example, if ACT-based concepts eventually yield to RFT interpretations. Consider the example from the current research where self as context may be operationally defined in terms of a combination of deictic and hierarchical frames. This would in practice be bottom-up. It is certainly the case that this approach is appropriate for integrating ACT and RFT *at the present time* when the two pillars rely on distinctly different concepts. However, it may be the case eventually that middle level clinical concepts are no longer valuable and that clinicians will be trained to use bottom-up concepts from the beginning. In such a scientific ideal, a reticulated model would no longer be necessary.

Of course, there are a number of inherent areas of clear overlap between ACT- and RFT-based concepts because they hail from the same functional, behavioural, contextual tradition. However, recent discussion and research has added to this integration by beginning to identify specific areas in which the two pillars appear, at least, to be talking about the same thing. The current programme of empirical work is part of this new endeavour. It is not its aim to decide whether CBS should follow or reject a reticulated model of its basic processes. That is a matter for conceptual debate and something that will emerge across years of empirical research. All that we have done here is to illustrate what the beginnings of such a debate and such a research agenda might look like.

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Appendices

Appendix 1
Consent Form

I……..consent to participate in an experimental psychology study being run by Mairead Foody in the Department of Psychology, National University of Ireland, Maynooth. I understand and consent to the following:

- The experimental procedure will likely involve brief periods of anxiety and/or emotional discomfort at various stages. The purpose of this cannot be explained to me at the beginning of the experiment but I will be fully debriefed at the end.
- The experimental procedure will involve scoring psychological measures. These scores are not used to make decisions about the experiment and I can be provided with the scores at the end of the experiment. However I understand that these scores do not represent clinical outcomes.
- The experiment will last approximately thirty minutes or less.
- I will be required to fill in various questionnaires and perform a task
- I am free to terminate my participation in the study at any time and may withdraw the data obtained from my participation, if I so wish.
- I understand that I participate under my own volition and that my participation will not have any effect on my subsequent academic results. I also understand that no monetary remuneration will result from participation.

I have received this information in an understandable way. All my questions have been answered.

Please print and sign your name below if you are willing to abide fully by the conditions stated above.

Name: _____(Please print in block capitals)

Signature: _____

Date: _____

EXPERIMENTER:

I, Mairead Foody, as primary experimenter, accept full responsibility for the care of all experimental participants and I confirm that all the necessary safety precautions have been taken and that additional experimental conditions followed in other studies have also been introduced.

Signature of experimenter: _____

Date: _____

Appendix 2
Experimental Screening Questionnaire

THIS INFORMATION IS STRICTLY CONFIDENTIAL

1. Age:_____

2. Sex:_____

3. Do you suffer from any of the following conditions? (please tick)

Yes	No	
___	___	**Anxiety or Phobic Disorder**
___	___	**Panic Attacks**
___	___	**Obsessive Compulsive Disorder**
___	___	**Depression**
___	___	**Any mental health problem that you think would be adversely affected by very brief periods of anxiety**

4. Do you have a driver's license?

Yes No

5. Have you ever been in a traumatic road accident?

Yes No

6. Has a close relative or friend passed away in the recent past?

Yes No

7. Has a close relative or friend ever been killed or seriously affected by a road traffic accident?

Yes No

Appendix 3
AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2.	I'm afraid of my feelings.	1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5.	Emotions cause problems in my life.	1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7.	Worries get in the way of my success.	1	2	3	4	5	6	7

Appendix 4
Philadelphia Mindfulness Scale (PHLMS)

Instructions: Please circle how often you experienced each of the following statements *within the past week.*

1. I am aware of what thoughts are passing through my mind.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

2. I try to distract myself when I feel unpleasant emotions.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

3. When talking with other people, I am aware of their facial and body expressions.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

4. There are aspects of myself I don't want to think about.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

5. When I shower, I am aware of how the water is running over my body.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

6. I try to stay busy to keep thoughts or feelings from coming to mind.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

7. When I am startled, I notice what is going on inside my body.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

8. I wish I could control my emotions more easily.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

9. When I walk outside, I am aware of smells or how the air feels against my face.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

10. I tell myself that I shouldn't have certain thoughts.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

11. When someone asks how I am feeling, I can identify my emotions easily.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

12. There are things I try not to think about.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

13. I am aware of thoughts I'm having when my mood changes.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

14. I tell myself that I shouldn't feel sad.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

15. I notice changes inside my body, like my heart beating faster or my muscles getting tense.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

16. If there is something I don't want to think about, I'll try many things to get it out of my mind.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

17. Whenever my emotions change, I am conscious of them immediately.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

18. I try to put my problems out of mind.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

19. When talking with other people, I am aware of the emotions I am experiencing.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

20. When I have a bad memory, I try to distract myself to make it go away.

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

Appendix 5
Visual Analogue Scale (VAS)

1) Please rate the level of discomfort you feel right now. Please place an X at this point along the line.

No Discomfort **Very Much Discomfort**

_____

0% **25%** **50%** **75%** **100%**

2) Please rate the level of anxiety you feel right now. Please place an X at this point along the line.

No Anxiety **Very Much Anxiety**

_____

0% **25%** **50%** **75%** **100%**

3) Please rate the level of stress you feel right now. Please place an X at this point along the line.

No Stress **Very Much Stress**

_____

0% **25%** **50%** **75%** **100%**

Appendix 6
Reactions Questionnaire

1) **Please rate your level of willingness to engage with your thoughts of the accident. <u>Place an X at this point along the line.</u>**

No effort **Lots of effort**

0% **25%** **50%** **75%** **100%**

2) **Please rate how vivid your thoughts and images were of the car accident. <u>Place an X at this point along the line.</u>**

Not vivid **Very vivid**

0% **25%** **50%** **75%** **100%**

3) **Please rate how believable the accident scenario was to you. <u>Place an X at this point along the line.</u>**

Not believable **Very believable**

0% **25%** **50%** **75%** **100%**

4) **Please rate how much guilt you feel right now. <u>Place an X at this point along the line.</u>**

Not guilt **Lots of guilt**

0% **25%** **50%** **75%** **100%**

5) **Please rate how morally wrong you felt it was to write or say the sentence(s). Place an X at this point along the line.**

Not morally wrong **Very morally wrong**

0% **25%** **50%** **75%** **100%**

6) **Please rate how much you tried to distract from the sentence(s). Place an X at this point along the line.**

Not morally wrong **Very morally wrong**

0% **25%** **50%** **75%** **100%**

*** Question 6 was not included in Experiments 1 and 3.**

Appendix 7
Debriefing Form

Thank you for giving up your time to participate in this experiment, particularly as it involved experiencing unpleasant thoughts and feelings. I would be more than happy to answer any of your questions regarding the study at this time. Do you have any questions you would like to ask?

At this point, I am going to briefly summarise for you the purpose of the experiment and explain any aspects which, for procedural reasons may not have been explained prior to the experiment. As you are probably aware, the aim of the task in this experiment was to encourage you to make direct contact with negative thoughts. When this contact was established (and you may have felt anxious for example, at this stage), the intervention was implemented to target these negative thoughts. The general goal of the experiment was to investigate the extent to which the intervention worked on reducing your believability of your negative thoughts.

Please sign below if you believe you have been fully debriefed on this experiment and you are satisfied that all of your questions have been fully answered.

Signature: _____

Thank you again for your time, without participants this research would not be possible.

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Appendix 8
Experimental Screening Questionnaire

THIS INFORMATION IS STRICTLY CONFIDENTIAL

4. Age:_____

5. Sex:_____

6. Do you suffer from any of the following conditions? (please tick)

Yes	No	
___	___	**Anxiety or Phobic Disorder**
___	___	**Panic Attacks**
___	___	**Obsessive Compulsive Disorder**
___	___	**Depression**
___	___	**Any mental health problem that you think would be adversely affected by very brief periods of anxiety**

Appendix 9
Reactions Questionnaire

1) Please rate your level of willingness to engage with your thoughts of the sentence. Please place an X at this point along the line.

No effort **Lots of effort**

0% 25% 50% 75% 100%

2) Please rate how believable the sentence was to you. Please place an X at this point along the line.

Not believable **Very believable**

0% 25% 50% 75% 100%

3) Please rate how vivid your thoughts and images were of this sentence. Place an X at this point along the line.

Not vivid **Very vivid**

0% 25% 50% 75% 100%

4) Please rate how much guilt you feel right now. Place an X at this point along the line.

Not guilt **Lots of guilt**

0% 25% 50% 75% 100%

5) Please rate how much you tried to distract from the sentence. Place an X at this point along the line.

No distraction **A lot of distraction**

0% 25% 50% 75% 100%

Appendix 10
Demographic Questionnaire

1. What is you name?

2. How old are you?

3. What do you study?

4. What year are you in?

5. Where are you from?

6. Where do you live?

7. How many brothers and sisters do you have?

8. What are your hobbies?

9. What hair colour do you have?

10. What colour are you eyes?