

1998

Does the conceptual nature of worry contribute to its uncontrollability? : unravelling the complex interactions of some of the properties of worry

Jacinta M. Willans
Edith Cowan University

Recommended Citation

Willans, J. M. (1998). *Does the conceptual nature of worry contribute to its uncontrollability? : unravelling the complex interactions of some of the properties of worry*. Retrieved from <https://ro.ecu.edu.au/theses/993>

This Thesis is posted at Research Online.
<https://ro.ecu.edu.au/theses/993>

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.
- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).
- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

**DOES THE CONCEPTUAL NATURE OF WORRY
CONTRIBUTE TO ITS UNCONTROLLABILITY?
UNRAVELLING THE COMPLEX INTERACTIONS OF SOME
OF THE PROPERTIES OF WORRY.**

By

Jacinta M. E. C. Willans BA DipEd BLitt BPsych.

A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of
Master of Psychology (Clinical),
School of Psychology,
Faculty of Health & Human Sciences,
Edith Cowan University.

Acknowledgements

Thank you Associate Professor Helmes for your advice and support in completing this study. Thanks also to the Masters candidates and staff at ECU who participated in early, helpful discussions relating to the methodology of the study, and who continued to be very supportive throughout the whole process. Special, insouciant thanks also to Clare Shannon and my best friend and husband, Anthony David Barr.

Table of Contents

	Page Number
Title Page	1
Acknowledgements	2
Tables & Figures	4
Abstract	5
Introduction	8
Method	29
Results	38
Discussion	45
References	58
Appendices	67

List of Tables

Table 1. Experimental design	31
Table 2. Optional speech topics	32
Table 3. Number of participants in each cell after compliance check	39
Table 4. Mean scores on measures of Depression, Anxiety and Obsessive compulsive disorder.	40
Table 5. Means and standard deviations of self reported intrusions of valenced mentations during periods of suppression and non suppression.	41

List of Figures

Figure 1. Age range of participants	38
Figure 2. Percentages of males and females who participated in the experiment	39
Figure 3. A significant interaction effect for thought instruction and mentation.	42
Figure 4. The interaction effect for valence and thought instruction.	44

Abstract

This project aims to examine a particular property of worry that some therapists claim interferes with the treatment of clients who worry. Research has shown that worry is predominately composed of concepts or thoughts rather than images (Borkovec & Hu, 1990). In particular this project aims to investigate whether the *verbal linguistic nature* of worry contributes to the sense that participants have that it is uncontrollable. Attempting to control an image results in a paradoxical effect of an increase in the frequency of the image (Wegner, Schneider, Carter & White, 1987). Does the same paradoxical effect occur when thoughts and not images are suppressed? This project seeks to determine whether there is a differential effect when personally relevant valenced thought and personally relevant valenced images are suppressed. To investigate whether a difference exists, 80 participants reported the number of intrusions of a self nominated positively or negatively valenced personally relevant mentation during an 10 minute interval. A 2 (valence: negative, positive) x 2(mentation: image, thought) by 2 (thought instruction; suppress, free expression) Analysis of Covariance (ANCOVA) examined the difference in the immediate and subsequent effects that occur when individuals are instructed to suppress valenced personally relevant thoughts, as compared to when individuals are instructed to suppress valenced personally relevant images. Results showed that there were no significant differences between the overall manipulation of thoughts and images during the testing interval. However, there was a significant interaction of thought instruction and type of mentation which resulted in a significantly lower number of intrusions ($p=.004$) for suppression of thoughts. A post hoc test on the interaction between

valence and thought instruction ($p=.051$), for negatively valenced mentations revealed a significant decrease in the number of negative cognitions in the post suppression period ($p = .027$). All of this implies, firstly, that the conceptual nature of worry is unlikely to contribute to an appraisal of uncontrollability, and secondly, that suppression of negatively valenced mentation may be an effective way of reducing aversive intrusive activity.

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature

.....

Date

.....

Does the Conceptual Nature of Worry Contribute to its Uncontrollability? Unravelling the Complex Interactions of Some of the Properties of Worry.

Very often therapists coach clients in techniques that are intended to help to control aversive mental activity. These techniques include simple coping techniques such as distraction or suppression (eg., thought stopping as in Dollard & Miller, 1950; Wolpe & Lazarus, 1966; Mathews & Milroy, 1994). However not all techniques achieve the desired results. For example, one aversive mental activity at which increased research is directed is worry, because techniques used to control worry have not always been effective, or even counter productive (Butler, 1994; Andrews, Crino, Hunt, Lampe & Page, 1994). Some have argued that this is due to one of the characteristics of worry, its conceptual nature (eg. Roemer & Borkovec, 1993; Borkovec & Lyonfields, 1993). Is the conceptual nature of worry also responsible for the perceived uncontrollability of worry?

The Conceptual Nature of Worry

Borkovec and colleagues concluded that worry is composed principally of thought because of a number of experiments that originated from a initial study of insomnia (Gross & Borkovec, 1982). In the original experiment, they saw that cognitive intrusion just prior to sleep resulted in retardation of sleep onset. Three groups of good sleepers were brought into a lab and given instructions to fall asleep as quickly as possible. One group was told nothing further, the second group was told that as some stage they would be woken to give a speech. The third group was told that as some stage they would be woken to give a speech on “how to

reduce inflation without inducing depression”. Gross and Borkovec (1982) found that participants in the third condition of cognitive intrusion manipulation took twice as long as the other two groups to fall asleep. This finding led to later experiments that attempted to look specifically at attempts to control the intrusive cognitive activity, which Borkovec and colleagues saw as worry.

In a large community sample, Borkovec & Lyonfields (1993) found that 51% rated worry as composed of thought, 3% rated worry as composed of images, and 46% rated worry as composed of a combination of thought and images. Furthermore, they found that when 300 college students were given a *forced choice* format, 70% reported that worry was composed of thought, and 30% reported that worry was composed of images. This finding that worry is composed predominantly of thoughts confirmed the earlier findings of Borkovec and Inz (1990).

Borkovec and Inz (1990) compared the self report of matched non-anxious controls and clients with *Generalised Anxiety Disorder (GAD)* during relaxation, directed worry and subsequent relaxation. Worry is defined as the cardinal feature of GAD (American Psychiatric Association, 1994). Borkovec and Inz (1990) found that “relaxing” controls reported a vast amount of imagery and little thinking, whereas GAD clients reported equal amounts of each. When asked to engage in personally relevant worry, both groups (the “relaxing” controls and the clients with GAD) showed a shift to heightened frequency of thought and lowered frequency of imagery. When both groups returned to the relaxation condition, both reported a return to previous levels.

Other Properties of Worry

Borkovec and colleagues argue that because worry is composed of thought rather than images it has additional properties. Specifically these properties have consequences for the treatment of worry or the treatment of anxiety disorders where worry is a major feature. I intend to discuss firstly the consequence of worry being composed of thought, and how the very nature of worry, its conceptual or thoughtlike structure, may interfere with treatment (Roemer & Borkovec, 1993; Borkovec & Lyonfields, 1993). The second important property that will be discussed is the uncontrollability of worry. I will then discuss the implications of attempts to control worry by addressing some of the relevant empirical findings of the suppression paradigm. It will be suggested that because worry is composed predominantly of thoughts rather than images, attempts to treat worry actually function to maintain worry. Attempts to control worry by suppressing worrisome thoughts may act to contribute to its uncontrollability.

If Worry is Composed of Thought, What Does This Mean for the Treatment of Worry

The discovery that worry is mainly composed of thought is important when considering treatment. Treating clients who worry or who have GAD has been shown to be difficult (eg., Andrews et al., 1994; Roemer & Borkovec, 1993).

One method of treatment that has been used is *emotional processing* (Foa & Kozak, 1986). The aim of emotional processing is to access the *affective associative systems*, thereby exposing the source of the fear that underlies the memory. This allows corrective information to change how the fearful stimuli should be viewed, which will eventually bring about habituation and a

corresponding reduction in symptomatology (Foa & Kozak, 1986). Exposure treatment is said to be effective only when the client emotionally processes the fearful stimuli (Foa & Kozak, 1986). Such processing is evidenced by a large initial physiological activation in response to the fearful material (Foa & Kozak, 1986). When a client avoids a fear cue either behaviourally or cognitively, the associative network of threatening material surrounding the cue is not accessed and therefore cannot be modified with corrective information (Foa & Kozak, 1986).

Roemer and Borkovec (1993) speculate that because worry is composed of thought, there are a number of consequences for treatment. Firstly, that for effective treatment of clients with an anxiety disorder (who concomitantly are experiencing worry), using emotional processing effectively is not possible because the conceptual (verbal linguistic) nature of worry prevents access to the affective associative network (Borkovec, Shadick & Hopkins, 1991; Roemer & Borkovec, 1993). As a consequence, two things result: first, physiological activation does not occur as a response to the threatening stimuli, and second, corrective information does not get through to the affective network.

The second important point is that although this process may be unconscious, the secondary gain of an absence of physiological activation may result in clients consciously using the conceptual nature of worry to avoid the aversive physiological symptoms that are the response to a fearful stimulus. That is, clients will engage in worry not simply to problem solve, but in order to avoid or gain relief from the aversive symptoms of anxiety (eg., Roemer & Borkovec, 1993).

Worry has certainly been found to suppress cardiovascular response to fearful stimuli. For example, Borkovec and Hu (1990) compared the cardiovascular response of three groups to a phobic stimulus. Prior to exposure, the groups were required to engage in neutral thinking, worrisome thinking or relaxation. They found that engaging in worrisome thinking before visualisation of a phobic image eliminated cardiovascular response to that image (Borkovec & Hu, 1990).

Conversely, Wells (1994) argues that the reason that corrective information does not get through is not because of the conceptual nature of worry but because there is a capacity overload, and the resulting bottleneck does not allow for the encoding of the corrective information.

Treating Worry

It is important therefore in the treatment of anxiety disorders to treat worry first (Roemer & Borkovec, 1993) because worry's conceptual nature may prevent access to the affective associative network. However, informal questioning of non pathological worriers carried out in pilot studies for research into the processes that people use to control worry suggest that the most common strategies these people use to control worry are distraction, problem solving and deciding not to worry (Butler, 1994). Are these strategies problematic when trying to treat worry?

Distraction techniques are sometimes presented to clients in order to relieve clients of negative symptomatology (eg., Beck, Rush, Shaw & Emery, 1979). These techniques include diversion techniques such as instructing clients to concentrate on detail items in consultation rooms, and have been found to reduce negative thought frequency and reduced affect (Fennel & Teasdale, 1984; Fennel,

Teasdale, Jones & Damle, 1987). They have not yet been shown to be effective with worry (Butler, 1994).

Other therapists argue that worry is actually exacerbated problem solving and that worriers have cognitive pre-dispositions that interfere with effective problem solving (Davey, 1994; Flett & Blankstein, 1994). Davey (1994) believes that worriers have a preponderance of negative cognitions, a tendency to interpret ambiguous events as threatening, and they have poor problem solving confidence. Accordingly, targeting these factors is an important approach in treatment, especially working on problem solving confidence (Davey, 1994).

The third factor that the pilot study nominated was “deciding not to worry”(Butler, 1994). Is this strategy associated with the perception that worry is uncontrollable?

The Uncontrollability of Worry

The difficulty of controlling the process of worry is a property of worry that has been shown to be problematic with treatment in both normal and clinical populations (Borkovec et al, 1990; APA, 1994). There are a number of theoretical positions on this. Some argue that worriers cannot decide not to worry, because it will result in a paradoxical result such as the content of worry returning to mind, leading to a perception that worry is uncontrollable (Roemer & Borkovec, 1993). Others maintain that worry is initiated automatically, but that its processing is a consciously controlled process (eg., Wells, 1994). Wells (1994) suggests that worry is a consciously controlled process. He believes that although it may be initiated automatically and involuntarily, it is a conscious controlled processing activity requiring large amounts of processing capacity. He suggests that one

reason for its uncontrollability is because of appraisals surrounding the involuntary initiation of worry.

Alternatively, Roemer & Borkovec (1993) suggest that it is like telling people not to think of a white bear. When people are told not to think about a white bear, paradoxically they cannot do so (Wegner, Schneider, Carter, & White, 1987). They report that during a period of attempted suppression of the image, the image of a white bear intrudes (Wegner et al, 1987). This increase in frequency of the image (relative to levels found when participants do not first suppress the thought) has been observed in a number of studies. The literature has reflected both an immediate increase in the frequency of the nominated mentation or a subsequent increase in the frequency of the nominated mentation after suppression has ceased. Perhaps during worry, in an attempt to suppress the frightening image or frightening thought, a process similar to the process of suppressing a white bear occurs; it becomes impossible, and multiple intrusions occur (Roemer & Borkovec, 1993). This argument has been supported by some studies. For example, Tallis, Davey and Capuzzo (1994) found that 75% of subjects in their study reported a paradoxical effect when they attempted to suppress worry. An important distinction, however, is that there is a difference in both the nature and the valence of a “white bear” and “worry” (Roemer & Borkovec, 1993). A white bear is a neutrally valenced image, and worry is a negatively valenced series of thoughts (Roemer & Borkovec, 1993).

The Role of Cognitions in Anxiety

It has been established that cognitive processes are implicated in anxiety disorders. Behavioural avoidance has been implicated in the maintenance of

phobias. For example, McNally and Steketee (1985) proposed that avoidance behaviour leads to fear maintenance. Cognitive avoidance such as suppression of specified mentations has empirically been shown to maintain and perhaps exacerbate anxiety disorders (eg., Zeitlen, Netten & Hodder, 1995). GAD is not the only disorder in which intrusive cognitions cause distress (Brown, Dowdall, Cote & Barlow, 1994). Disturbing, aversive, unwanted, intrusive mentations are also a common symptom of other psychological disorders such as *Post-traumatic stress disorder* (PTSD) and *Obsessive compulsive disorder* (OCD; APA, 1994). Very often, clients with these disorders try to suppress the negatively valenced conceptual activity and/or the negatively valenced image without notable success. Many researchers have pointed out the utility of laboratory models of the aetiology of obsessions or worry or flashbacks (eg., Wegner, 1989; Trinder & Salkovskis, 1994; Zeitlin et al., 1995). The suppression paradigm has been suggested as one avenue for developing a laboratory model of certain anxiety disorders (eg., Wegner, 1989; Trinder & Salkovskis, 1994).

Since the first experiment by Wegner et al. (1987) empirical research with the suppression paradigm has revealed information that may be helpful in developing models of psychopathology. This additional information may help us to understand more about the uncontrollability of worry. For example, if we establish there is a difference between the suppression of a thought as compared to suppression of an image, then it would also be useful to establish whether there is also a difference in the suppression of valenced mentation.

Review of the Suppression Paradigm

Wegner et al. (1987) found that suppression of the images of white bears led to a *rebound effect*. While participants are suppressing a particular thought, they report fewer occurrences of that thought than participants who are not suppressing. However when they stop suppressing, they report more occurrences of the thought than people who did not suppress. This finding was replicated by Clark, Ball and Pape (1991), who used the stimulus of green rabbits with three groups who were required to verbalise their stream of consciousness for 2 two-minute periods. In the first period, one group was asked to think about anything except green rabbits, the second group was asked to think about anything including green rabbits, and the third group was asked to think about anything at all. In the second period, all groups were asked to think about anything at all. Consistent with the rebound effect, the first group reported significantly fewer images of green rabbits than the other two groups in the first period, and they reported significantly more images of the green rabbits in the second period.

In contrast to this finding by Wegner et al. (1987) and Clark et al (1991) of a rebound effect, others (eg., Lavy and van den Hout, 1990 and Merckelbach, Muris, van den Hout and de Jong, 1991) found an immediate *enhancement effect* during the suppression period. An enhancement effect differs from a rebound effect by virtue of when the paradoxical effect occurs. With a rebound effect there is a paradoxical effect evident in the post suppression period, whereas with an enhancement effect there is a paradoxical effect immediately apparent in the suppression period itself.

There continues to be no clear consistency as to when a rebound effect or enhancement effect occurs (Muris, Merckelbach, van den Hout & de Jong, 1992). Some researchers (eg., Trinder & Salkovskis, 1994) have argued that suppression is most likely a continuous process. They suggest it is unlikely that people are able to suppress a particular mentation for a period only to have it return in greater numbers. As such, the enhancement effect may be an explanation that may be applicable to models of psychological disorders such as OCD in which intrusive thoughts are prominent (Trinder & Salkovskis, 1994).

Experiencing unwanted intrusive thoughts has been found to be experienced by 80% of the nonclinical population (Rachman and de Silva, 1978). The similarity between normal intrusive thoughts and clinical intrusive thoughts led Rachman (1978) to speculate that normal intrusive thoughts may play a role in the aetiology of OCD. This was later extended by Salkovskis (1985, 1989) in a cognitive behavioural hypothesis of OCD. It was argued that the initial appraisal of an intrusive thought led to beliefs of personal responsibility based on the content of the intrusion, and subsequently to compensatory behaviours. Appraisal is central to his hypothesis (Salkovskis, 1989). Trinder and Salkovskis (1994) also noted the role that appraisal of initial intrusions may have in the development of disorders such as OCD and PTSD

Wegner (1988, 1989) argues that the rebound effect represents a laboratory model of the aetiology of real life obsessions. This is in line, he argues, with the clinical studies that show abnormal obsessions are accompanied by an urge to resist or suppress the intrusive thoughts (eg., Rachman & de Silva, 1978).

However, the parallel between the rebound/enhancement effect and abnormal

obsessions is not as clear cut. Until clear predeterminates exist it is hard to extend the findings in the suppression paradigm to other models of psychological disorders. Zeitlin et al (1995) observe that determining whether there is a rebound effect or an enhancement effect may depend on the clinical disorder. For example, clinical reports of OCD and PTSD patients suggest that attempts to suppress intrusive mentations result in an immediate increase in their occurrence (Zeitlin et al, 1995).

The Role of the Valence of the Mentation Affecting a Rebound and/or an Enhancement Effect

Some studies have indicated the valence and the personal relevance of the mentation are implicated in the paradoxical result of attempts at suppression of intrusive thoughts. For example, Muris et al.(1992) found the valence of the mentation may influence whether there is a rebound effect. They found a clear difference in an experiment in which one group was required to suppress valenced material and another group was required to suppress neutral material. They found that the immediate enhancement effect seems to be limited to situations in which suppression is directed at neutral material. This finding is in accordance with the findings of Lavy and van den Hout (1990) who found an immediate enhancement effect when participants were instructed to suppress neutral thoughts (sic) about a vehicle.

These findings were in line with others. Wegner and Gold (1992) looked at the application of suppression to participant's own thoughts of a previous romantic partner. Participants were divided into two groups: those who were to suppress thoughts of a still desired previous romantic partner (a "hot flame") and those who

were to suppress thoughts of a no longer desired previous romantic partner (a “cold flame”). The data suggested that the rebound effect may not occur when the mentation is valenced. Their findings were in contrast with the retrospective study of Muris and Merckelbach (1991, as cited by Muris et al, 1992) who found data to suggest that suppression of emotional material would produce strong rebound effects.

Certainly, Wenzlaff, Wegner and Roper’s (1988) series of experiments found that depressed individuals’ efforts to suppress negatively valenced thoughts were undermined by the selection of emotionally valenced distracters. The data from these experiments suggested that depressed participants suffered from a particular deficit in the suppression of negatively valenced material, but were able to suppress positively valenced material. To assess this, Wenzlaff and others (Experiment 1) examined the valence of the thoughts preceding and following the specific intrusion. They found that the results supported the hypothesis that depressed individuals employ distracters that are emotionally related to the negative thoughts they are trying to suppress and, therefore serve to prompt awareness of the unwanted material.

However even when supplied with positive distractors, and even while recognising that positive distractors are more efficient, depressed individuals chose negative distractors because they are more accessible (Wenzlaff et al, 1988, Experiment 3).

Wenzlaff, Wegner and Klein (1991) found in a series of experiments that suppression creates a bond between the suppressed mentation and the associated valence of the context. In the first experiment they induced positive and negative

mood states with the associated suppression of a neutral mentation. In the subsequent free expression period, they found that if the induced mood state matched the previous suppression induced mood state, participants reported more intrusions of the negative stimulus. This was in comparison with participants whose mood induced states in the expression period were not matched with the mood induced state in the initial suppression period. Again this process is similar to that proposed by Wells and Papageorgiou (1994) in their conceptualisation of the process of worry.

Wells and Papageorgiou (1994) believe that worry both tags and blocks emotional integration. The tagging increases the subsequent number of mood related intrusions. The blocking occurs because the conceptual nature of worry prevents further processing of images, and thus prevents integration of the emotional material. This is further maintained because the conceptual nature of worry consequently blocks the aversive physiological activation, and thus acts to maintain anxiety because it is also blocking emotional integration. This will therefore lead to a maintenance of intrusions as a symptom of incomplete emotional processing (Rachman, 1980).

Distinguishing Between Thought and Images in the Suppression Paradigm

The suppression paradigm does not distinguish between thought and images. Wegner and Gold (1992) did not distinguish between thoughts about the previous romantic partner and images of the previous romantic partner. They suggested that the rebound effect may not occur with emotional thoughts because the participants may, somehow, defend themselves from them. However, intrusive thoughts can be both pleasant and unpleasant (Edwards & Dickerson, 1987), and mentations about

previous romantic partners could intuitively be either or both. Mentations about previous partners may also be images or conceptual or both.

In their investigation of the effects of suppression of personal intrusive thoughts, Kelly and Kahn (1994) apparently did not distinguish between thoughts and images. In fact they defined the mentation to be suppressed to include both the thought, and the image that comes to mind when the thought is initiated.

Participants were asked to draw the resulting image, and then to label the image with one or two words. During the suppression period, participants were asked to suppress the image and/or the words used to describe the image with no distinction of which participants suppressed which type of mentation.

The Influence of the Personal Relevance of the Mentation in Determining Whether

There is a Rebound and/or Enhancement Effect

Kelly and Kahn (1994, Experiment 1) found that valence played no part in the presence of a rebound effect. However in Experiment 2, they compared the suppression of a white bear with the participant's personally relevant intrusive thought/image. In this experiment, participants in the *personally relevant intrusive thought/image* condition were required to write down their most frequently occurring intrusive thought. Secondly, all participants were required to visualise a picture of the mentation that they were required to manipulate. They found that suppressing images of a white bear was significantly more difficult than suppressing images/thoughts of a personally relevant image/thought.

They argued that the personal relevance of the mentation may play a key role in the ability of the participant to defend themselves from the intrusive mentation (Kelly & Kahn, 1994, Experiment 1 & 2). They suggest that this is because the

participant has had time to establish a network of distractor thoughts that will enable further intrusions to be defended. As such, participants given a new mentation to suppress will use the immediate environment, which in laboratory settings may be very sparse, whereas those who have already developed distractor thoughts will have a wider field to draw from. Kelly and Kahn (1994) suggest that experience with a mentation will reduce or reverse the rebound. They also suggest that a lack of continuity between expression and initial suppression contexts may account for the presence of the rebound effect. Specifically, they suggest that because participants are asked to express previously suppressed thoughts in a new setting, they are unable to access the network of distractors that might be available in the prior setting.

Methodological Issues with the Suppression Paradigm

As already mentioned, there are a number of crucial methodological points about using the findings of the suppression paradigm in order to develop a model of psychological disorders. Firstly, in all of the suppression experiments there is no distinction between the type of mentation (ie., images or thoughts) when instructing the participants. It may be that some participants are suppressing images and some are suppressing thoughts. It has not yet been established that the mechanism of suppression is the same with the different types of mentation (Roemer & Borkovec, 1993). It has been suggested that distinguishing between thought and images is important, as the nature of these different types of mentations may influence the efficacy of treatments such as the use of emotional processing (Foa & Kozak, 1986).

A further crucial methodological point is the relevance of the mentations that participants may be asked to suppress. For example, Salkovskis and Campbell (1994) found an enhancement effect for those participants who were asked to suppress personally relevant negatively valenced mentations. In contrast Kelly & Kahn (1994) suggested that experience with the mentation to be suppressed enabled the establishment of a distractor network, and hence a reduction or reversal of the rebound. Some researchers (eg., Muris et al., 1992) have argued that it is important to establish a predictable model in the laboratory before attempting to apply findings in the paradigm to models of clinical disorders. However, other findings (eg., Kelly & Kahn, 1994; Wenzlaff, Wegner and Roper, 1988) indicate that the personal relevance of the mentation as well as the context in which the stimulus is suppressed may be significant in the paradoxical effect of suppression. Therefore trying to confine the research to the laboratory may not be the most fruitful way to proceed.

Developing a Methodology

There are also differences in the manner in which the number of intrusive mentations are measured in many of these experiments. Some have argued (eg., Salkovskis & Campbell, 1994) that the difference in the effect may be due to the manner in which the number of intrusive mentations are measured. For example, studies by Wegner et al. (1987), Wegner, Schneider, Knutson and McMahon (1991) and Clark et al. (1991) where researchers found evidence of a rebound effect required participants to verbalise their stream of consciousness, and to ring a bell when they experienced the intrusive thought. Conversely, Merckelbach et al. (1991) and Muris et al. (1992), who did not find evidence of a rebound effect,

used a different methodology. They asked participants to think silently and to press the button of an event marker when the intrusive thought occurred.

However, Muris, Merckelbach and de Jong (1993) found that similar results are obtained using different methods (ie., streaming or recording) of measuring mentation intrusions. In their experiment, they found no evidence of a rebound effect with both groups.

Borkovec and Roemer (1993) noted that it would be hard to develop the methodology that enables us to look at the difference in defining a thought and defining an image, particularly in an experimental setting. Thought or conceptual activity is defined as a verbal linguistic activity (Borkovec & Lyonfields, 1993; Borkovec & Inz, 1990). Methodologies which would require verbalising the stream of consciousness would suit the experimental manipulations of thought but would not suit experimental manipulations of imagery. Accordingly, using a clicker or tick mechanism would most likely be conducive to both types of mentations. It would seem probable that participants who are asked to distinguish between thought and imagery in an experimental manipulation would find it difficult to suppress one type of mentation to concentrate on the other. Such instructions would most likely only confound the object of the experiment.

Defining thought in this experimental manipulation was based on early experiments on insomnia by Borkovec and colleagues. In these early experiments, Gross and Borkovec (1982) instructed participants in a sleep setting that they were going to be awakened at some point to give a speech on “how to reduce inflation without reducing depression”. As a result of this cognitive manipulation,

participants in this sleep group engaged in worry or predominantly verbal linguistic activity, and took twice as long to get to sleep. Accordingly, it was decided for this study to instruct participants in any thought suppression group that they would be required to present a speech at some future time. Participants who would be required to suppress an image would be induced to choose a particular scene.

Zeitlin et. al. (1995) noted that the suppression paradigm may hold the key to understanding different patterns in different clinical disorders and hence enable us to build models of psychopathology. Specifically the empirical findings within this paradigm may enable us to understand what happens when clients attempt, consciously or not, to control their own symptomatology. Initially it is helpful to look at what happens in a nonclinical population, before selecting different clinical disorders to examine. It is recognised that there are always individuals who have undiagnosed levels of clinical depression, clinical anxiety and/or OCD. Accordingly measures of clinical depression, anxiety and OCD should be taken in order to account for confounding differences in the experimental conditions solely due to the presence of these disorders.

Order of Presentation

A further important methodological issue is the issue of the order of presentation. Some studies (eg., Borkovec & Hu, 1990; Borkovec & Inz, 1990) have implicated the order of presentation or preparedness in the development of psychopathological symptomatology. This would be in accordance with Gray's (1982) theory of anxiety, which holds that the behavioural inhibition system is activated when there is a mismatch between incoming information and expected

information when the expected information is aversive. This has methodological consequences in two ways. Firstly, it is a strong rationale for presenting the clinical instruments last, so the aversive reaction to their content noted in the pilot study does not affect the participants in the differently valenced groups. Secondly, if Gray's theory is correct, then it may influence any *within* group manipulation of positive and negative valence. Accordingly, the manipulation of valencing the mentation should be between the nominated groups.

Present Study

In this context the present experiment is designed to examine the role of the three independent variables, Mentation, Valence and Thought Instruction over an interval. Mentation refers to the two types of cognitive activity: verbal, linguistic activity or thought, and images. Valence refers to two poles of valence, positive and negative. Thought instruction refers to suppression and non suppression. An outline of the implications of manipulating these variables will be presented before outlining the hypotheses.

The nature of the mentation. If there is a difference in the manipulation of thoughts and images over the interval, then this tells us that the ability to suppress, then not suppress is different for thoughts and images.

Valence. If there was a significant difference in the number of valenced mentations between the groups due to the valence of the mentation, this would tell us that whether the mentation was valenced either positively or negatively significantly affects the number of reported intrusions over the interval.

Thought instruction. If there was a significant difference between the groups because of the thought instruction (suppression or non suppression) then this

manipulation would replicate the findings of the suppression paradigm and may enable us to understand the predeterminates of the existence of a rebound effect (eg., Wegner et al., 1987; Clark et al., 1991), or an enhancement effect (eg., Lavy & van den Hout, 1990; Merckelbach et al., 1991).

Valence and mentation. If there was an interaction effect between Valence and type of Mentation, this would mean that there is a difference in the number of self-reported intrusions at different levels of the two independent variables, Valence and Mentation. That is to say that there is a different number of intrusions because of the nature of the mentation (thought or image) and the valence of the mentation (positive or negative). If as Borkovec and colleagues suggest, worry is composed predominantly of thoughts which are negatively valenced and there is a significant difference between the number of intrusions of negatively valenced thoughts compared to positively valenced images, then it might be argued that the conceptual nature of worry contributes to the uncontrollability of worry.

Mentation and thought instruction. If there was an interaction effect for Mentation and Thought Instruction, there would be a different number of self-reported intrusions for each type of mentation (thought, image) during suppression and non suppression.

Valence and thought instruction. If there was an interaction effect for valence and thought instruction, this could be due to a significantly different number of intrusions dependent on the valence of the mentation during suppression and non suppression. For example, either negatively valenced mentations could result in significantly more intrusions during suppression or positively valenced mentations could do so during the suppression period. Alternatively, negatively valenced

intrusions could result in significantly more intrusions than would positively valenced mentations result during the non suppression period. The influence of valence on intrusion during a period of an interval of suppression followed by non suppression may be helpful in understanding the processes involved in disorders which are negatively valenced and in which some form of suppression may be implicated.

Mentation by valence by thought instruction. If there was a interaction effect for Mentation by Valence by Thought Instruction, it would mean that there was a difference in the number of self-reported intrusions for a particular combination of the three independent variables. The interpretation of such an effect would depend upon a more detailed analysis of the exact results.

Aims and Hypotheses

The intention of the project is to examine whether there is a difference in the suppression and subsequent non suppression of the two types of cognitive activity. In addition the project will examine whether the positive or negative valence of the cognitive activity has a differential effect during the interval of suppression, followed by non suppression. It is hypothesised that there will be a difference in the differential effects of the suppression of the two types of valenced mentation.

Method

Participants

Initial participants were 100 male and female undergraduates recruited from Churchlands and Joondalup campuses at Edith Cowan University, Western Australia. Participants, whose ages ranged from 18 to 60, were given no credit or financial benefits for their participation.

Coursework assessments occurred for these students in the period following week 8 onwards and anecdotal reports indicated that high levels of anxiety and/or depression were common around assessment time. Anecdotal reports also reported that first year students were highly anxious at the commencement of semester one. Accordingly testing took place in weeks 2-5 of semester two because it was anticipated that this was the time of least anxiety and least depression for the participants.

Design

A 2 (*Valence*: positive, negative) by 2 (*Mentation*: thought, image) by 2 (*Thought Instruction*: suppression, expression) design was used. Participants were randomly allocated to one of four groups; *negative image*, *negative thought*, *positive image* or *positive thought*, with Thought Instruction as a within-participant variable.

There were three parts to the experiment: the initial part, the experimental part and the manipulation checks.

Procedure

On arrival, all participants were asked to wait for five minutes in another room before they were taken into the experimental room. This was to give participants the opportunity to calm themselves, if necessary, before the experiment was conducted. If participants seemed too rushed or anxious to wait, another appointment was offered. At the commencement of the experiment, participants were taken to a sound proof room, where they were invited to sit in a large comfortable chair. The room was approximately 2 square metres, and contained a comfortable chair, a desk and a spare chair. There was a two way mirror through which participants could be viewed. All participants were initially told that they were involved in a study of the way people think, and they were then given the chance to ask questions. Each participant was told that they could stop the experiment at any time, and that they could leave at any time.

After each participant was given a few minutes to settle down, they were read the standardised instructions relevant to the group to which they were allocated. Students were randomly allocated to one of four groups (See Table 1).

Table 1.
Experimental Design

Allocated Group	Period	
	Thought	Instruction
1. Negative Image	Suppression	Non suppression
2. Negative thought	Suppression	Non suppression
3. Positive image	Suppression	Non suppression
4. Positive thought	Suppression	Non suppression

Specifically participants in the image groups were asked to picture something that they found to be either positively or negatively valenced, respectively. Participants in the thought groups were asked to choose a topic for a speech on either a negative or positive topic. Participants in the thought groups were given lists of general topics that might be stimulus for topics that were personally relevant to them (Kelly & Kahn, 1994; see Table 2). All participants took as much time as they needed to choose the respective image or speech topic, and all participants were told that they did not have to disclose the content of their mentation.

Table 2.

Optional Speech Topics Made Available To All Participants.

Positively valenced topics:

How my pet brings me joy.

My TEE results and how they have shaped my future.

The birth of a child.

The love of my life and why I call him/her that.

When I win Lotto...

Negatively valenced topics:

My TEE results and how they have changed my future.

Losing the love of my life.

The abuse of children: should it be punished or forgotten.

The death of a pet.

The death of a parent and the influence on my life.

Based on content of intrusive thoughts of 104 participants in Experiment 1, Kelly & Kahn, 1994.

When they had chosen the content of their mentation, they were told to “please indicate on a scale of 1 to 10 how negative/positive (as appropriate) you would rate the topic.” If participants rated the personally relevant mentation as less than 7/10, then participants were asked how they could change the mentation to make it more positively valenced or negatively (as appropriate). The session continued if the participant rated the valence of the personally relevant mentation as greater than or equal to 7.

The Experimental Period

The suppression period. In this section of the experiment, participants were read the standardised instructions relevant to their assigned group (See Appendix A). Participants in the image groups were asked to ‘not think about the agreed image for a period of 5 minutes.’ If participants found that the image did come to mind, they were told to suppress the image, and to indicate that the image has returned by marking the worksheet which was placed in front of them (See

Appendix B). In order to prepare for that possibility, participants were asked to have the pencil in their hand near the worksheet. When it was clear that the participant understood the instructions, the experimenter left the room, and returned after 5 minutes was completed.

Participants in the thought groups were read the standardised instructions relative to their group. They were told that they would be invited to 'give a speech on the agreed topic in approximately 10 minutes time'. They were told that the speech would be videotaped, but there would be no audience, and no one viewing the tape. Until then participants were told to suppress all thoughts of the speech, that they could think about anything during this time, but they should not think about the speech they were going to give. Participants were instructed however, that if they found their thoughts slipping towards the speech, they should suppress the thought, and mark the worksheet in front of them. In order to prepare for that, they were instructed to have the pencil in their hand near the paper. When it was clear that the participant understood the instructions, the experimenter left the room, and returned after 5 minutes was completed.

The Non Suppression Period. When the experimenter re-entered the room, all participants were told 'that they should feel free to think about anything'. If they should think about the agreed mentation (as appropriate) they should not suppress the mentation, "but continue to feel free to think about anything." If the agreed mentation did come to mind, then they were instructed to mark the worksheet in front of them. When participants indicated that they understood the instructions, the experimenter left the room for a period of 5 minutes.

Overview of Manipulation Checks and Debriefing

Participants were taken to a different room and they were asked to rate their compliance to instructions by indicating on a scale of 1 to 10, where 10 is most compliant, and 1 is least compliant.

A detailed consent form was also given to participants to complete (See Appendix C). Although consent was obtained from all the participants at the commencement of the experiment, a detailed written consent form was given at this stage. In the consent form they were again told the role of the experiment, and they were also told that if they had experienced suicidal ideation, they would be contacted. They were then left to complete the *Beck Depression Inventory* (BDI : Beck, Rush, Shaw & Emery, 1979), the *Beck Anxiety Inventory* (BAI : Beck, Epstein, Brown & Steer, 1988), and the *Maudsley Obsessive Compulsive Inventory* (MOCI : Hodgson & Rachman, 1977; Rachman & Hodgson, 1980). These inventories are reproduced in Appendix D.

All participants were monitored through a one way mirror during this phase to ensure that participants did not become suffer any ill effects. Participants were also given the opportunity in the final debriefing to explore any emotional after effects with the experimenter. In particular, participants were informed that they would be contacted by the experimenter if they indicated the presence of suicidal ideation. After completing the instruments a full debriefing was then conducted with each participant, and the purpose of the experiment was explained.

Manipulation Checks

Valence. Participants rated how positive or negative their personally relevant mentation was at the commencement of the experiment. Participants did this by

rating the valence out of 10, where 10 is the maximum valence and 1 is the minimum valence.

Compliance to instructions. Participants were asked at the completion of the experiment to indicate whether they had complied with the instructions that were given to them. Participants did this by rating compliance out of 10, where 10 is the maximum compliance and 1 is the minimum compliance.

Instruments

Anxiety. Participants completed the BAI after the experimental phase of the study. The BAI was designed to measure those symptoms of anxiety that are minimally shared with those of depression, particularly those symptoms measured by the BDI. It consists of 21 items that measure the severity of self-reported anxiety. The total score is the sum of the ratings given by the examinee for the 21 symptoms. Each symptom is rated on a 4 point scale ranging from 0 to 3. The maximum score is 63 points. The BAI score ranges are given as an aid in interpreting the intensity of self-reported anxiety. Total scores of 0-7 points are given the rating of minimal anxiety; scores of 8-15 indicate mild anxiety; scores of 16-25 indicate moderate anxiety; and scores of 26-63 indicate severe anxiety. However Beck & Steer (1987, 1990) recommend some caution in using these ranges. The BAI was developed on psychiatric outpatients, but has been found to be effective with nonclinical samples (Dent & Salkovskis, 1986). In their study of nonclinical samples, Dent & Salkovskis (1986) found the mean BAI scores to be half those of clinical samples diagnosed with anxiety disorders (Fydrich, Dowdall & Chambless, 1990; Beck & Steer, 1990, 1987). For example, they found in a sample of 65 university students, that the mean BAI score was 11.08 (SD =9.10).

Similarly in a sample of 142 medical students, the mean BAI score was 8.89 (SD = 7.30) and in a sample of 36 non students the mean BAI was 7.78 (SD = 5.65).

Depression. Participants completed the BDI at the completion of the experiment. The BDI has been widely used for the assessment of symptoms associated with depression for both clinical and nonclinical populations (eg., Steer, Beck & Garrison, 1985). The purpose of using this instrument is to identify participants who are classified as clinically depressed. A total of 21 symptoms are included: participants are requested to rate the intensity of these symptoms on a scale from 0 to 3. Typical questions relate to such areas as sleep disturbance, sense of failure and loss of appetite. The inventory is self administered and takes from 5 to 10 minutes. The total possible range of scores extends from a theoretical low of 0 to a high of 63. No or minimal depression is indicated by a score of less than 10, mild depression ranges from 10 to 16, moderate depression from 17 to 29 and severe depression from 30 to 63 (Beck & Steer, 1987). Evaluation of content, concurrent and discriminant validity as well as factor analysis has generally been favourable (Groth-Marnot, 1990). A meta-analysis of the different efforts to establish internal consistency has show them to range form .73 to .92 with a mean of .86 (Beck, Steer & Garbin, 1988).

Obsessive compulsive disorder. Participants completed the *MOCI* (Hodgson & Rachman, 1977; Rachman & Hodgson, 1980) at the completion of the experiment. The *MOCI* is quick and easy to administer and consists of 30 items with true/false answers (Hodgson & Rachman, 1977; Rachman & Hodgson, 1980). In addition to a global obsessiveness score, it gives four sub-scores; checking, washing/cleaning, slowness/repetitiveness and doubting/conscientiousness. The *MOCI* has been

found to differentiate between OCD and other anxiety disorders (Hodgson & Rachman, 1977; de Silva, 1994). In a study of 100 obsessional and 50 non-obsessional patients, Hodgson and Rachman (1977) found that the MOCI clearly differentiated between the two groups: obsessional patients had a mean score of 18.86 (S.D. = 4.92) while non-obsessional patients had a mean score of 9.27 (S.D. = 5.43).

Results

The data from six participants were not included because they indicated during the post experimental manipulation checks that they had not followed instructions. Twenty participants withdrew from participation after recruitment because they found they did not have time to complete the experiment, or because of undisclosed personal reasons. The data from the remaining 74 participants were used to evaluate the hypothesis. 80% of the remaining participants were in the age category of 17-35 years (See Figure 1).

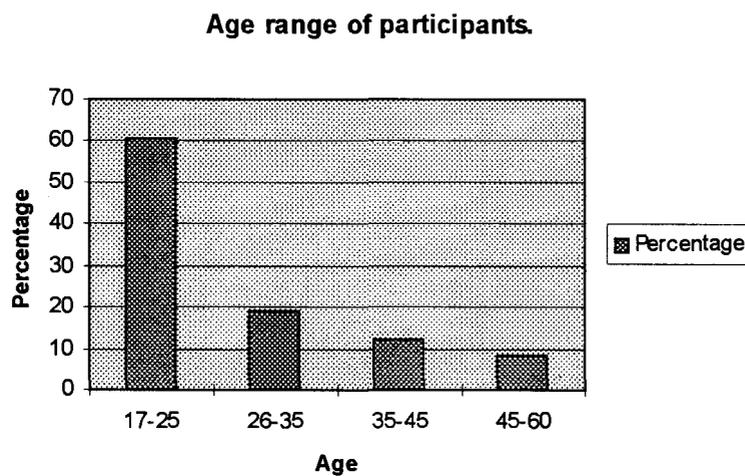


Figure 1. The age range of participants in the experiment.

A greater number of females participated in the experiment (See Figure 2). As there is no evidence in the literature that gender difference contributes to differential suppression effects, this was not considered to be problematic for this experiment.

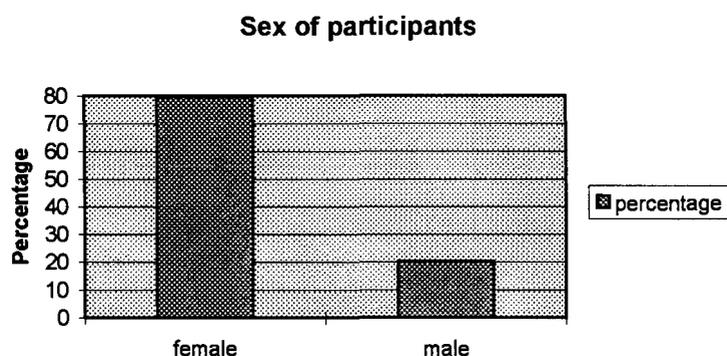


Figure 2. The percentage of males and females who participated in the experiment.

The number of participants in each of the four groups was approximately even (See Table 3).

Table 3.

The number of participants in each cell after compliance check.	
Group	Frequency
negative image	19
negative thought	17
positive image	19
positive thought	19

The BAI (Beck et al, 1988), BDI (Beck & Steer, 1987) and MOCI (Hodson & Rachman, 1977; Rachman & Hodgson, 1980) revealed varying levels of anxiety, depression and OCD in the experimental population. Overall, the mean scores for each of these disorders fell within the non-clinical range (see Table 4).

Table 4.

Mean scores on measures of Depression, Anxiety and Obsessive Compulsive Disorder

Instrument	Mean	Std Deviation
BAI	8.1	5.74
BDI	6.8	5.64
MOCI	5.7	4.21

Note. BAI- Beck Depression Inventory; BDI - Beck Depression Inventory;

MOCI - Maudsley Obsessive Compulsive Disorder Inventory.

The means and standard deviations of self reported intrusions during the periods of suppression and non suppression are reported in Table 5.

Table 5
Means and standard deviations of self reported intrusions of valenced mentations during periods of suppression and non suppression.

	Mentation	Valence	Mean	Standard Deviation
Suppression	Image	Negative	10.05	7.86
		Positive	8.10	4.20
		Total	9.08	6.3
	Thought	Negative	5.18	3.68
		Positive	6.1	4.38
		Total	5.67	4.03
	Total	Negative	7.75	6.64
		Positive	7.1	4.35
		Total	7.42	5.55
Non suppression	Image	Negative	5.26	4.98
		Positive	7.84	4.96
		Total	6.55	5.07
	Thought	Negative	6.06	4.66
		Positive	8.53	8.51
		Total	7.36	6.98
	Total	Negative	5.64	4.77
		Positive	8.18	6.88
		Total	6.95	6.05

A 2 (Mentation: thought and image) by 2 (Valence: positive and negative) by 2 (Thought instruction: suppression and non suppression) ANCOVA was done on the remaining data with BDI, BAI and MOCI scores added as covariates (See Appendix E). An alpha level of .05 was used for all statistical tests.

Main Effects

The nature of the mentation. The first hypothesis examines whether there is a difference in the suppression and subsequent non suppression of the two types of cognitive activity. As reported in Table 6, there was no significant main effect for Mentation, $F(1, 67) = 1.467, p = .230$.

The valence of the mentation. The hypothesis as to whether the positive or negative valence of the cognitive activity has a differential effect during the interval of suppression, then non suppression was tested next. As reported in Table 6, there was no significant main effect for Valence, $F(1,67) = .700$, $p = .406$

Thought instruction. As reported in Table 6, there was no significant main effect for Thought Instruction, $F(1, 67) = 1.241$, $p = .269$. This tells us that the thought instruction (to suppress or not to suppress) did not result in a significantly different number of intrusions

Interaction Effects

Valence and mentation. As reported in Table 6, there was no interaction effect for Valence and Mentation, $F(1, 67) = .518$, $p=.474$.

Mentation and thought instruction. As reported in Table 6, there was a significant interaction effect for thought instruction and mentation, $F(1, 67) = 9.145$, $p = .004$ (See Figure 3).

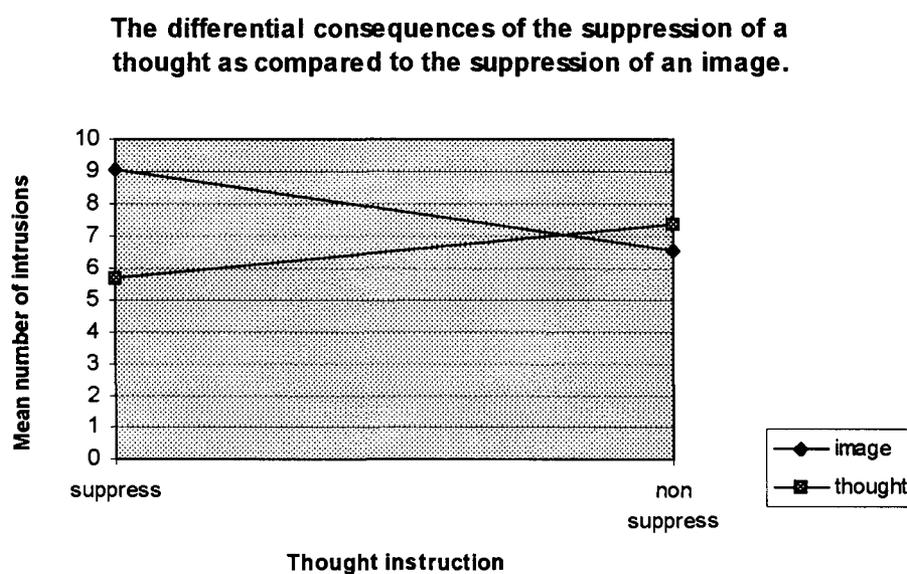


Figure 3. A significant interaction effect for thought instruction and mentation.

Visual inspection of the interaction effect suggests that participants had more difficulty suppressing images than thoughts. An independent t test was performed on the two cognitive groups during suppression. The result of the t test indicates that during the suppression period, participants from the image groups had significantly more intrusions than participants in the thought groups, $t(72) = 2.758$, $p = .007$. An independent t test was performed on the different mentation groups during the non suppression period. Results indicated that during non suppression, participants from the two different cognitive groups did not have significantly different numbers of intrusions, $t(72) = (-.572)$, $p = .569$.

Valence and thought instruction. The influence of valence on intrusion during a period of an interval of suppression, then non suppression may be helpful in understanding the processes involved in disorders which are negatively valenced, and in which some form of suppression may be implicated. As reported in Table 6, the interaction effect just failed to reach significance, $F(1, 67) = 3.957$, $p = .051$ (See Figure 4). A paired sample t test, $t(36) = 2.302$, $p = .027$ for negatively valenced mentations revealed a significant decrease in the number of negative cognitions in the post suppression period.

The differential consequences of the suppression of a positively valenced mentation as compared to the differential consequences of the suppression of a negatively valenced mentation.

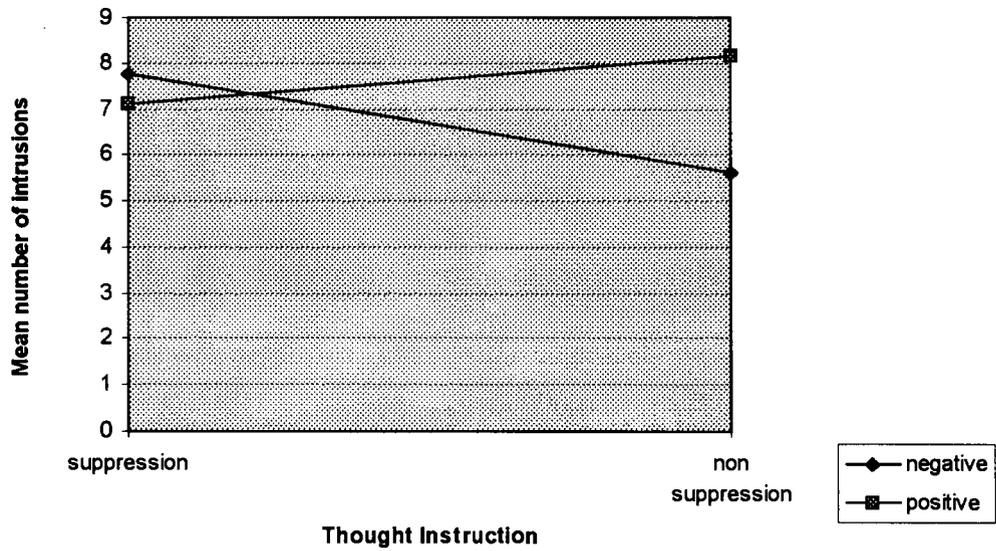


Figure 4. The interaction effect for valence and thought instruction.

Mentation by valence by thought instruction. As reported in Table 6, there was no interaction effect for Mentation by Valence by Thought instruction, $F(1, 67) = .595$, $p = .443$.

Discussion

This project examined firstly whether there was a difference in the suppression and subsequent non suppression of the two types of cognitive activity, thoughts and images. The study also looked at the influence that valence had on the differential effects of suppression. It was hypothesised that there would be a difference in the effects of the suppression of the two types of valenced mentation. The hypothesis was supported. The specific empirical, theoretical and methodological implications of this will be discussed in two sections: the differential effects of suppressing the two types of mentations, and the differing effects of suppressing valenced cognitive activity. A summary of the implications will then be presented.

It is Easier to Suppress Thoughts Compared to Images.

There was a significant interaction effect for thought instruction and mentation. The data suggest that participants had more difficulty suppressing images than thoughts but that there was no significant difference in the number of intrusions in the post suppression period. What are the implications of this?

The Suppression Paradigm. Firstly, in terms of the suppression paradigm, we can say, comparatively speaking, there is an enhancement effect for images, but not for thoughts. That is to say, participants experience a paradoxical effect when they try to suppress images, compared to when they try to suppress thoughts. During the post suppression period, there is no significantly different paradoxical effect between the two groups.

We can infer from these data that one of the determinates of an enhancement effect is the specified nature of the mentation, that an intrusion is more likely to occur if it is an image rather than a verbal linguistic cognition. It was noted that the suppression paradigm may hold the key to understanding different patterns in different clinical disorders, and in doing so help us to build models of psychopathology (Zeitlin et al., 1995). This empirical finding enables us to understand what happens when clients attempt, consciously or not, to control their own symptomatology. Attempting to suppress an image or images will result in an initial paradoxical effect, whereas attempts to suppress verbal linguistic cognitions will result in significantly fewer intrusions.

Specifically, if a participant attempts suppression of a personally relevant valenced image, and finds as demonstrated in this experiment a paradoxical effect of the intrusion returning to mind again and again, then its possible that the perception of uncontrollability will result. This effect however will only continue until the impetus to suppress is withdrawn, and then there is no significant difference in the number of intrusions. Caution should be taken with extrapolating this finding into clinical disorders too quickly, as this particular result does not distinguish between positively and negatively valenced mentations. That is to say, both positively and negatively valenced images are more difficult to suppress than positively and negatively valenced verbal linguistic cognitions, and the valence of intrusions associated with clinical disorders such as worry, OCD and PTSD are defined as negatively valenced.

Methodological limitations with using the enhancement/rebound label. It is because of the significant differences between the number of intrusions in the mentation groups that we say there is an enhancement effect for images compared

to thoughts. Strictly speaking, we would compare the number of intrusions with a group who have not been exposed to any instructions not to suppress.

Similarly we might ask whether the equivalency of intrusions in the post suppression period is actually what Wegner would call a rebound effect. The labelling of a paradoxical effect as either an enhancement/rebound effect according to Wegner and colleagues has been determined by comparison with a group that has not been instructed to suppress any form of mentation. In this experiment, only comparative declarations have been made. If necessary further investigations may be warranted as necessary to ascertain if the findings here are necessarily comparable to the “rebound and/or enhancement effect” as labelled in the suppression paradigm. With this caution that the effect found refers to a comparative effect, we will however refer to the effect found as an enhancement/rebound effect.

It is interesting to note overall that the thought instruction, to suppress or not to suppress, did not result in a significantly different number of intrusions. What this experiment indicates is that while overall there may appear to be no paradoxical effect, (eg., a rebound effect as in Wegner et al., 1987 and Clark et al., 1991 or an enhancement effect as in Lavy & van den Hout, 1990; Merckelbach et al, 1991), in actual fact suppression of a personally relevant valenced verbal linguistic mentation results in an enhancement effect. It is suggested that previous inconsistencies in empirical findings in the suppression paradigm may have been due to not distinguishing the type of mentation to be suppressed. An alternative explanation might be that conceptual activity may result in a paradoxical effect if there is sufficient power in the experiment. One way of increasing power would be

by increasing the number of participants. This is a consideration that should be allowed for in future experiments

To summarise, the methodological significance of this is that previous inconsistencies in the suppression paradigm may have been due to the nature of the mentation. The finding that suppression of a personally relevant image results in significantly more intrusions than suppression of a personally relevant verbal linguistic mentation in the initial period of suppression may account for previous inconsistent results in the suppression paradigm. An alternative explanation is that the experiment was underpowered, to allow for there to be a significant effect for conceptual activity.

Theoretical Implications of Finding that Images are Harder than Thoughts to Suppress

Trinder and Salkovskis (1994) noted the role that appraisal of initial intrusions may have in the development of disorders such as OCD and PTSD. With both of these disorders, the nature of the intrusions may include both thoughts and images. Quite likely the appraisal of the paradoxical effect, due to a largely imaginal content, may lead clients to experience a sense of uncontrollability. Resulting compulsions to compensate for the alarming intrusions may, as suggested by Salkovskis (1989, 1990), be implicated in the aetiology of OCD. Experiencing unwanted intrusive cognitive activity has been found to be experienced by 80% of the nonclinical population (Rachman and de Silva, 1978). The similarity between normal intrusive thoughts and clinical intrusive thoughts led Rachman (1978) to speculate that normal intrusive thoughts may play a role in the aetiology of OCD. This was later extended by Salkovskis (1985, 1989) in a cognitive behavioural hypothesis of OCD.

The high rate of intrusions may also be implicated in the aetiology of PTSD. Intuitively, it seems likely that the re-experiencing of a traumatic event that occurs with PTSD (APA, 1994) would be in the form of images, probably images of the actual traumatic event. The appraisal of the subsequent high rate of intrusions would lead to associated symptomatology that is associated with PTSD, such as for example continued distress and physiological arousal (APA, 1994). This finding is consistent with Trinder and Salkovskis' (1994) assertion that suppression may be responsible for the aetiology and maintenance of disorders such as PTSD and OCD.

The same argument cannot however account for a sense of uncontrollability that occurs with worry in both clinical and non clinical populations (Borkovec et al, 1990; APA, 1994) if as has been found, the content of worry is predominantly verbal linguistic (Borkovec & Lyonfields, 1993; Borkovec & Inz, 1990). It has been suggested that the perception of the uncontrollability of worry may be due to its conceptual nature. This study found that suppression of conceptual mentations results in significantly fewer intrusions than suppression of imaginal mentations. Therefore the lower rate of intrusions of conceptual activity are comparatively least likely to lead to an appraisal that worry is uncontrollable. We can speculate as to whether there is a threshold at which an individual decides that the paradoxical effect is uncontrollable. Perhaps this could be a focus for further research.

To summarise, it was noted that the suppression paradigm may hold the key to understanding different patterns in different clinical disorders, and in doing so help us to build models of psychopathology (Zeitlin et al., 1995). This empirical finding enables us to understand what happens when clients attempt, consciously or not,

to control their own symptomatology. Caution should be taken with extrapolating this finding into clinical disorders too quickly as this particular result does not distinguish between positively and negatively valenced mentations. However, while it continues to be possible to argue that this finding may concur with a hypothesis that appraisal of the paradoxical effect results in the aetiology of OCD and PTSD, this would not be the case with worry. That is to say, it would not be the case with worry because of worry's predominantly verbal linguistic nature and the comparative lower rate of conceptual intrusions. To argue more comprehensibly it is important to look at the role of valence in these processes.

The Role of Valence

The project also examined whether the positive or negative valence of the cognitive activity had a differential effect during the interval of suppression, then non suppression.

The influence of positive or negative valence on intrusions during the interval of suppression, then non suppression may be helpful in understanding the processes involved in disorders which are negatively valenced, and in which some form of suppression may be implicated. The interaction effect between valence and thought instruction just failed to reach significance. There are two reasons why we should consider the effect to be significant: first, because the probability level was .051, and second because variability as measured by the covariates was measured at the end of the experiment. It may be that removing the variability as measured by the covariates also removed the shared variability of the dependent variable which was affected by the independent variables. Ideally this is usually avoided by taking the measures for the covariates at the commencement of the experiment, but in this experiment the instruments used to measure covariates were negatively

valenced, and would have confounded the experiment. In summary, we consider the probability level of the interaction between valence and thought instruction to be significant.

Subsequent tests showed that negative mentations compared to positive mentations decrease significantly in the post suppression period. What is also interesting is that this finding applies for both negatively valenced thoughts and negatively valenced images, as the higher interaction between mentation and valence and thought instruction was not significant.

Suppressing Negative Thoughts and Images Results in Significantly Fewer

Intrusions in the Post Suppression Period

The application of the finding that negatively valenced mentations decrease significantly in the post suppression period will be discussed by firstly addressing the application to the suppression paradigm, and then by discussing the theoretical implications.

Application to the Suppression paradigm

This finding may shed some light on the conflicting findings in the suppression paradigm. Perhaps the inconsistencies are due to two things: firstly as already discussed, not distinguishing between both the nature of the mentation to be suppressed, and/or secondly, not consistently distinguishing between the valence (either positive or negative) of the cognitive activity to be suppressed.

Theoretical implications

This project has shown that a paradoxical effect is significantly more likely to occur with images, than with thoughts. It has also shown that the number of negatively valenced intrusions compared to positively valenced intrusions

significantly decreases in the post suppression period. Addressing these findings may be a fruitful way of explaining inconsistencies and establishing a means of developing models of psychopathology. For example, it has been previously argued that suppression of negatively valenced mentation is hampered by selection of negatively valenced distractors

In contrast to Wenzlaff et al (1988) this experiment found that there was no significant difference in the ability to suppress positive or negatively valenced mentations, but rather that suppression of negative mentations led to significantly fewer intrusions in the post suppression period when compared with suppression of positively valenced mentations. The results of this suggest that participants are not confined to selecting only negative distractors, as there is no difference between the number of positively and negatively valenced intrusions during suppression. Further, distraction, if that is the process that is occurring, is possible in the post suppression period for negatively valenced cognitive activity.

The role of valence in determining a paradoxical effect. Some empirical studies had indicated that only suppression of neutrally valenced mentation resulted in a paradoxical effect (Muris et al, 1992; Lavy and van den Hout, 1990; Wegner & Gold, 1992), whereas other studies had indicated that suppression of a valenced cognition resulted in a paradoxical effect (Muris and Merckelbach, 1991, as cited by Muris et al, 1992). This project has demonstrated that a paradoxical effect is predetermined by suppression of valenced mentation, but may be influenced by the nature of the mentation, and whether the valence is positive or negative.

The personal relevance of the stimulus and the valence appear to be influential in determining this effect. This study may clarify Wenzlaff, Wegner & Klein's

(1991) assertion that the contextual valence of the suppressed mentation determines the subsequent paradoxical effect in the post suppression period. In their experiment, only a neutral stimulus was used, but it was paired with a positive or negative valenced context. In the post suppression period they found that matched contextual valence across the suppression and the non suppression period results in greater intrusions than non matched contextual valence.

This study determined that the polarity of the valence may also determine the presence of subsequent intrusions. The two studies differ in that Wenzlaff et al's (1991) study did not use personally relevant valenced mentations, but artificially induced valence onto a neutral stimulus. The theoretical implications of Wenzlaff et al's (1991) study is that polarity of the induced valence becomes bonded to the stimulus during suppression, and seems to act as a involuntary reminder of the stimulus. The polarity of the personally relevant valenced stimuli, as shown in this study, actually determines the non suppression rate of intrusion, suggesting either of two things: firstly, that the personal relevance of the valenced stimuli determines the result, or secondly, that the polarity of the valence determines the result. In the former case, it has been suggested that the personal relevance of the stimuli enables the participant to have already established a distractor network (Wegner & Gold, 1992). If this is true, then it should be true for both positive or negative stimuli. This suggestion is not consistent with the results of this study. In the latter case, in which the polarity of the mentation determines the result, there are a number of speculative reasons why this might be so. Firstly, perhaps the negatively valenced stimuli is so aversive, that the participants continue to suppress, even though they report that they have stopped suppressing. Whereas for the positive group, the stimuli is not so aversive, and the need to avoid the

stimulus is not as necessary. If this is the reason, then it implies a level of mental control.

Such a position would be consonant with Well's (1994) theoretical position on worry that although the initial intrusion may be automatic, the continuing processing is a consciously controlled process. He believes that although worry may be initiated automatically and involuntarily, that it is a conscious controlled processing activity requiring large amounts of processing capacity. One reason he suggests for its uncontrollability is because of appraisals surrounding the involuntary initiation of worry.

We have seen however that the conceptual intrusions are comparatively less frequent than imaginal intrusions. As already mentioned, it would be necessary to establish a threshold of the number of intrusions occurring that initiate a labelling of uncontrollability before one could argue that the results of this study are totally consonant with Wells' theoretical position.

This study however does not clarify Wells and Papageorgiou's (1994) argument that worry both tags and blocks emotional integration. They argued that tagging, a generalising of retrieval cues, increases the subsequent number of mood related intrusions. This study has found that an attempt to suppress negatively valenced thoughts and images results in a post suppression decrease in the number of intrusions when compared to positively valenced intrusive activity. The results of this study seem to imply that tagging does not occur, or if it does, that it is under conscious control. An alternative explanation is that suppression of negatively valenced mentations results in a degree of emotional integration, as evidenced by the reduction of intrusive mentations (Rachman, 1980). That is to

say, blocking of emotional integration that is said to occur because of worry's conceptual nature does not occur because of the process of suppression.

The results of this study seem to warrant further investigation with reference to reconciling Wells and Papageorgiou's position. Such an investigation might include physiological measures that might indicate if a lack of an anxiety response is maintaining a blocking of emotional integration.

To summarise, the finding of this study that the negative polarity of the valence of a mentation results in a significant decrease in a post suppression decrease in intrusive mentations implies one of two things. First, that emotional processing occurs for negatively valenced mentations when suppressed, as evidenced by the reduction of intrusive mentations (Rachman, 1980). Alternatively, that processing of intrusive activity is under conscious control, and the resulting decrease in negatively valenced mentation in a post suppression period is because of a conscious desire to avoid the aversively valenced mentations.

Summary

This study has enabled us to clarify whether the conceptual nature of worry contributes to the appraisal that clinical and non-clinical populations have that worry is uncontrollable. It was proposed that it was unlikely that the conceptual nature of worry contributes to this appraisal of uncontrollability because suppression of conceptual activity results in significantly fewer intrusions than suppression of imaginal cognitive activity. In coming to this position, this study has identified pre-determinates of paradoxical effects in the suppression paradigm that occur when participants attempt to suppress cognitive activity. Specifically this study found that one predeterminate of a paradoxical effect is the nature of the

mentation: comparatively speaking, suppression of a thought is significantly less likely than an image to result in intrusive mentations. This finding could be a focus for further investigation, with an emphasis on comparing the significant difference with a presuppression period to enable a baseline measure to be taken. Such further investigation would enable generalising the results into treatment. It appears that another predeterminate is the polarity of the valence. Specifically, suppression of negatively valenced mentations results in a significant decrease in intrusions in the post suppression period.

This study also enabled us to examine more closely some empirical findings, and relative theoretical positions. If as has been postulated, suppression of negatively valenced mentations results in emotional processing, then the finding that suppressing negatively valenced mentations results in significantly fewer intrusions as compared to positive mentations in the post suppression period has a number of implications for treatment of disorders where intrusive cognitive activity is a symptom. For example, does thought stopping actually work? Does the resulting discovery that the number of intrusions decrease result in an appraisal in the post suppression period that one can actually stop worrying? This result would indicate that that might be the case. It is then understandable that clients may choose suppression as a way of controlling worry, as these results indicate that it may be effective.

Alternatively, it has been postulated that consistent with Wells' (1994) position, there is a level of conscious control over intrusion in a post suppression period, which results in an avoidance of the aversively valenced mentation. Further investigation is necessary to resolve these questions. Later investigations might

include extending to clinical samples of specific disorders to enable the establishment of psychopathological models (Zeitman et al, 1985), and hence potential bases for treatment.

References

- American Psychiatric Association. (1994) *Diagnostic and statistical manual of mental disorders*. (4th ed) Washington, DC: Author.
- Andrews, G., Crino, R., Hunt, C., Lampe, L. & Page, A. (1995) *The treatment of anxiety disorders*. Cambridge: New York. Cambridge University Press.
- Beck, A. T., Epstein, N., Brown, G. & Steer, R.A. (1988) An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893-897.
- Beck, A. T. & Steer, R. A. (1987) *Manual for the revised Beck Depression Inventory*. San Antonio. San Antonio, TX: The Psychological corporation.
- Beck, A. T. & Steer, R. A. (1990) *Manual for the revised Beck Depression Inventory*. San Antonio. San Antonio, TX: The Psychological Corporation.
- Beck, A. T., Rush, A.J., Shaw, B.F. & Emery, G. (1979) *Cognitive therapy of depression*. New York, NY: Guilford Press.

- Beck, A. T., Steer, R. A. & Garbin, M. (1988) Psychometric properties of the Beck Depression Inventory; Twenty-five years of evaluation. *Clinical Psychology Review*, 8, 77-100.
- Borkovec, T.D. & Hu, S. (1990) The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research Therapy*, 28, 60-73.
- Borkovec, T. D. & Inz, J. (1990) The nature of worry in generalized anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy*, 28, 153-158.
- Borkovec, T. D. & Lyonfields, J.D. (1993) Worry: Thought suppression of emotional processing. In Heinz Walter Krohene, (Ed.) *Attention and avoidance: strategies in coping with aversiveness*. (pp101-118) Gottingen, Hogrefe & Huber.
- Borkovec, T. D., Shadick, R., & Hopkins, M. (1991) The nature of normal versus pathological worry. In R. Rapee & D.H. Barlow (Eds). *Chronic anxiety: Generalised anxiety disorder and mixed anxiety-depression* (pp29-51). New York: Guilford Press.
- Brown, T. A., Dowdall, D. J., Cote, G. & Barlow, D. H. (1994) Worry and obsessions: the distinction between generalised anxiety disorder and obsessive-compulsive disorder. In Davey, G.C.L & Tallis, F. (Eds)

Worrying: Perspectives on theory, assessment and treatment (pp.229-246). Chichester: Wiley.

Butler, G. (1994) Treatment of worry in generalised anxiety disorder. In Davey, G.C.L & Tallis, F. (Eds) *Worrying: Perspectives on theory, assessment and treatment* (pp.209-228). Chichester: Wiley.

Clark, D. M., Ball, S. & Pape, D. (1991) An experimental investigation of thought suppression. *Behaviour Research and Therapy*, 29, 253-257.

Davey, G.C.L. (1994) Pathological worrying as exacerbated problem-solving. In Davey, G.C.L & Tallis, F. (Eds) *Worrying: Perspectives on theory, assessment and treatment* (pp.35-60) Chichester: Wiley.

de Silva, P. (1994) Obsessions and compulsions. Investigation. In Lindsay, S.J.E. & Powell, G.E. (Eds.) *The Handbook of Clinical Adult Psychology*. (2nd ed., pp.51-70). Routledge, London.

Dent, H. R. & Salkovskis, P.M. (1986) Clinical measures of depression, anxiety and obsessionality in nonclinical populations. *Behavioural Research and Therapy*, 24, 689-691.

Dollard, J. & Miller, N. E. (1950) *Personality and psychotherapy*. New York: McGraw-Hill.

Edwards, S. & Dickerson, M. (1987) Intrusive unwanted thoughts: A two-stage model of control. *British Journal of Medical Psychology*, 60, 317-328.

Foa, E.B., & Kozak, M.J. (1986) Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, 99, 20-35.

Fennel, M. J. V. & Teasdale, J. D. (1984) Effects of distraction on thinking and affect in depressed patients. *British Journal of Clinical Psychology*, 23, 65-66.

Fennel, M.J.V., Teasdale, J.D., Jones, S. & Damle, A. (1987) Distraction in neurotic and endogenous depression: An investigation of negative thinking in major depressive disorder. *Psychological Medicine*, 14, 441-452.

Flett, G.L. & Blankstein, K.R. (1994) Worry as a component of test anxiety: a multidimensional analysis. In Davey, G.C.L & Tallis, F. (Eds) *Worrying: Perspectives on theory, assessment and treatment* (pp. 134-181). Chichester: Wiley.

Fydrich, T., Dowdall, D. & Chambless, D.L. (1990) *Aspects of reliability and validity for the Beck Anxiety Inventory*. Paper presented at the National Conference on Phobias and Related Anxiety Disorders, Bethesda, MD.

Gray, J.A. (1982) Precis of 'The neuropsychology of anxiety: An inquiry into the functions of the septo-hippocampal system'. *Behavioral and Brain Sciences*, 5, 469-534.

Gross, R.T. & Borkovec, T. D. (1982) Effects of a cognitive intrusion manipulation on the sleep-onset latency of good sleepers. *Behavior Therapy*, 13, 112-116.

Groth-Marnot, G. (1990) *Handbook of Psychological Assessment*. Wiley Interscience New York.

Hodson, R.J. and Rachman, (1977) Obsessive-compulsive complaints. *Behaviour Research and Therapy*, 15, 389-95.

Kelly, A. E., & Kahn, J.H. (1994) Effects of suppression of personal intrusive thoughts. *Journal of Personality and Social Psychology*, 66, 998-1006.

Lavy, E.H. & van den Hout (1990) Thought suppression induces intrusions. *Behavioural Psychotherapy*, 18, 251-258.

- McNally, R.J. & Steketee, G.S. (1985) The etiology and maintenance of severe animal phobias. *Behaviour Research and Therapy*, 23, 431-435.
- Mathews, A. & Milroy, R. (1994) Effects of priming and suppression of worry. *Behaviour Research and Therapy*, 32, 843-850.
- Merckelbach, H., Muris, P., van den Hout, M. and de Jong, P. (1991) Rebound effects of thought suppression: Instruction-dependent? *Behavioural Psychotherapy*, 19, 225-238.
- Muris, P., Merckelbach, H. & de Jong, P. (1993) Verbalisation and environmental cueing in thought suppression. *Behaviour Research and Therapy*, 31, 609-612.
- Muris, P., Merckelbach, H. van den Hout, M. & de Jong, P. (1992) Suppression of emotional and neutral material. *Behaviour Research and Therapy*, 30, 639-642.
- Rachman, S. (1978) Anatomy of obsessions. *Behaviour Analysis and Modification*, 2, 253-278.
- Rachman, S. (1980) Emotional processing. *Behaviour Research and Therapy*, 18, 51-60.

- Rachman, S.J. & de Silva, P. (1978) Abnormal and normal obsessions. *Behaviour Research and Therapy*, 16, 233-248.
- Rachman, S.J. & Hodson, R.J. (1980) *Obsessions and Compulsions*. Englewood Cliffs, NJ: Prentice-Hall.
- Roemer, L. & Borkovec, T.D. (1993) Worry: Unwanted cognitive activity that controls unwanted somatic experience. In Wegner, D.M. & Pennebaker, J.W. (Eds) *Handbook of mental control* (p 220-239). Prentice Hall, New Jersey.
- Salkovskis, P.M. (1985) Obsessional-compulsive problems: a cognitive-behavioural analysis. *Behaviour Research and Therapy*, 23, 571-583.
- Salkovskis, P.M. (1989) Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy*, 27, 677-682.
- Salkovskis, P.M. & Campbell, P. (1994) Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. *Behaviour Research and Therapy*, 32, 1-8.
- Steer, R.A. Beck, A.T., & Garrison, B. (1985). Applications of the Beck Depression Inventory. In N. Sartorius & T.A. Ban (Ed.) *Assessment of*

depression (pp121-142). Geneva, Switzerland: World Health Organisation.

Tallis, F., Davey, G C. L. & Capuzzo, N. (1994) The phenomenology of non-pathological worry: a preliminary investigation. In Davey, G.C.L and Tallis, F. (Eds) *Worrying: Perspectives on theory, assessment and treatment* (pp. 62-89). Chichester: Wiley.

Trinder, H., & Salkovskis, P.M. (1994) Personally relevant intrusions outside the laboratory: long-term suppression increases intrusion. *Behaviour Research Therapy*, 32, 833-842.

Wegner, D.M., Schneider, D.J., Carter, S.R., & White, L. (1987) Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology*, 63, 5-13.

Wegner, D.M. (1988) Stress and mental control. In Fisher, S. & Reason, J. (Eds). *Handbook of life stress, cognition and health*. New York: Wiley.

Wegner, D.M. (1989) *White bears and other unwanted thoughts. Suppression, obsession and the psychology of mental control*. New York: Viking.

- Wegner, D.M., Schneider, D.J., Knutson, B. and McMahon, S.R. (1991). On polluting the stream of consciousness: The effect of thought suppression on the mind's environment. *Cognitive Therapy and Research*, 15, 141-152.
- Wegner, D.M. and Gold, D.B. (1995) Fanning old flames: emotional and cognitive effects of suppressing thoughts of a past relationship. *Journal of Personality and Social Psychology*, 68, 782-792.
- Wells, A. (1994) Attention and the control of worry. In Davey, G.C.L and Tallis, F. (Eds) *Worrying: Perspectives on theory, assessment and treatment* (pp. 91-114). Chichester: Wiley.
- Wells, A., & Papageorgiou, C (1994) Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy*, 33, 579-583.
- Wenzlaff, R. M., Wegner, D.M. & Klein, S.B. (1991) The role of thought suppression in the bonding of thought and mood. *Journal of Personality and Social Psychology*, 60, 500-508.
- Wenzlaff, R.M., Wegner, D., & Roper, D.W. (1988) Depression and mental control: the resurgence of unwanted negative thoughts. *Journal of Personality and Social Psychology*, 55, 882-892.

Wolpe, J. & Lazarus, A.A. (1966) *Behavior therapy techniques*. New York:
Pergamon Press.

Zeitlin, S.B, Netten, K.A., and Hodder, S. H. (1995). Thought suppression : an
experimental investigation of spider phobics. *Behaviour Research
Therapy*, 33, 407-413.

Appendix A

Instructions to each group

Group 1. Suppression of negative image

- I would like you to **picture** something that you would find very negative. It may be something that you found to be very distressing or made you very angry or upset. Please take your time to think of something that you consider to be very negative. I would like you to imagine yourself in that situation. Picture what is around you. Picture what you are feeling. Picture your surroundings. Is there anyone else there? What does it look like? What does it smell like. What colour is it? What does it feel like? When you feel that you have an image clearly in your mind, please let me know. On a scale of 1 to 10, where 1 is the least distressing, and 10 is the most distressing how would you rate it?. (If greater than 7, proceed. if not, ask what would make this more negative.)
- Now, I would like you to **not** think about the agreed image for the next 5 minutes. If the image does come to mind, I would like you to suppress the image. Please however, indicate that the image has returned by marking the sheet in front of you. In order to prepare for that I would like you to have the pencil in your hand near the paper. (Participant should indicate that he/she understands.) I will tell you when the five minutes is up.

(Experimenter leaves the room, and returns after five minutes)

- Now, I would like you to feel free to think about **anything** for the next five minutes. If you think about the agreed image, don't suppress the image, but continue to feel free to think about anything. If the image does come to mind, then please mark the paper in front of you.

- Finally, Please rate on a scale of 1- 10 how **negative** you found the image to be now. Remember that 1 is least negative and 10 is the most negative.

- Please also indicate on a scale of 1 to 10 how well you think you **complied** with the instructions that were given to you.

Group 2. Suppression of negative thought

- I would like you to choose a topic for a **speech** from the list in front of you. Please choose the topic that you find the most emotionally negative. I would like you to pick a speech that you find the most upsetting or distressing. If you can't find a topic there that you don't find upsetting, then please feel free to think of a speech topic that you find personally upsetting. Take some time to think of a speech topic that is appropriate.
- Please indicate on a scale of 1 to 10 how negative you find the topic. (If greater than 7 than proceed, if not ask how you can change the topic to make it more positive or negative).

- Now in about ten minutes I would like you to give this speech on the agreed topic. Before then I would like you to suppress all thoughts of the speech. You can think about anything during this time, but please do **not** think about the speech that you are going to deliver. If you **do** find your thoughts slipping towards it, then please suppress the thoughts, but indicate on the sheet in front of you. In order to prepare for that I would like you to have the pencil in your hand near the paper. (Participant should indicate that he/she understands.) I will tell you when the five minutes is up.

- Now, I would like you to feel free to think about **anything** for the next five minutes. If you think about the agreed speech, don't suppress the speech, but continue to feel free to think about anything. If the speech does come to mind, however, then please mark the paper in front of you.

- Finally please indicate on a scale of 1 to 10 how positive you find the speech topic to be now.

- Please also indicate on a scale of 1 to 10 how well you think you complied with the instructions that were given to you. (That is, firstly by choosing a negative speech topic, attempting to suppress the topic, and finally thinking freely.)

Group 3. *Suppression of positive image*

- I would like you to **picture** something that you would find very positive. It may be something that you found to make you very happy or joyful. Please take your time to think of something that you consider to be very positive. I would like you to imagine yourself in that positive situation. Picture what is around you. Picture what you are feeling. Picture your surroundings. Is there anyone else there? What does it look like? What does it smell like. What colour is it? What does it feel like? When you feel that you have an image clearly in your mind, please let me know. On a scale of 1 to 10, where 1 is the least distressing, and 10 is the most distressing how would you rate it?. (If greater than 7, proceed. if not, ask what would make this more negative.)

-

- Now, I would like you to **not** think about the agreed image for the next 5 minutes. If the image does come to mind, I would like you to suppress the image. Please however, indicate that the image has returned by marking the sheet in front of you. In order to prepare for that I would like you to have the pencil in your hand near the paper. (Participant should indicate that he/she understands.) I will tell you when the five minutes is up.

(Experimenter leaves the room, and returns after five minutes)

- Now, I would like you to feel free to think about **anything** for the next five minutes. If you think about the agreed image, don't suppress the image, but continue to feel free to think about anything. If the image does come to mind, then please mark the paper in front of you.

- Finally, Please rate on a scale of 1- 10 how **negative** you found the image to be now. Remember that 1 is least negative and 10 is the most negative.

- Please also indicate on a scale of 1 to 10 how well you think you **complied** with the instructions that were given to you.

Group 4. Suppression of positive thought

- I would like you to choose a topic for a **speech** from the list in front of you. Please choose the topic that you find the most emotionally positive. I would like you to pick a speech that you find the most happy or joyful. If you can't find a topic there that you don't find positive and uplifting, then please feel free to think of a speech topic that you find personally positive and uplifting. Take some time to think of a speech topic that is appropriate. (Participant should indicate when ready)
- Please indicate on a scale of 1 to 10 how positive you find the topic. (If greater than 7 than proceed, if not ask how you can change the topic to make it more positive or negative).

- Now in about ten minutes I would like you to give this speech on the agreed topic. Before then I would like you to suppress all thoughts of the speech. You can think about anything during this time, but please do **not** think about the speech that you are going to deliver. If you **do** find your thoughts slipping towards it, then please suppress the thoughts, but indicate on the sheet in front of you. In order to prepare for that I would like you to have the pencil in your hand near the paper. (Participant should indicate that he/she understands.) I will tell you when the five minutes is up.

- Now, I would like you to feel free to think about **anything** for the next five minutes. If you think about the agreed speech, don't suppress the speech, but continue to feel free to think about anything. If the speech does come to mind, however, then please mark the paper in front of you.

- Finally please indicate on a scale of 1 to 10 how negative you found the speech topic to be now.

Please also indicate on a scale of 1 to 10 how well you think you complied with the instructions that were given to you. (That is, firstly by choosing a positive speech topic, attempting to suppress the topic, and finally thinking freely.)

Appendix B

Work sheet 1 for group 1

Work sheet 2 for group 2

Work sheet 3 for group 3

Work sheet 4 for group 4

Work Sheet 1

A. Rate your negative image on a scale of 1 to 10
(where 1 is least negative and 10 is most negative).

/10

B. Period 1

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

C. Period 2.

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

D. Please rate how negative you found the image to be now.

/10.

E. Please rate how well you complied with the instructions that were given to you.

/10.

F. Please feel free to make any comments about the testing or the instructions.

Work Sheet 2

A. Rate your negative speech topic on a scale of 1 to 10 (where 1 is least negative and 10 is most negative).

/10

B. Period 1

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

C. Period 2.

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

D. Please rate how negative you found the speech topic to be now.

/10.

E. Please rate how well you complied with the instructions that were given to you.

/10.

F. Please feel free to make any comments about the testing or the instructions.

Work Sheet 3

A. Rate your positive image on a scale of 1 to 10 (where 1 is least positive and 10 is most positive).

/10

B. Period 1

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

C. Period 2.

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

D. Please rate how positive you found the image to be now.

/10.

E. Please rate how well you complied with the instructions that were given to you.

/10.

F. Please feel free to make any comments about the testing or the instructions.

Work Sheet 4

A. Rate your positive speech topic on a scale of 1 to 10 (where 1 is least positive and 10 is most positive).

/10

B. Period 1

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

C. Period 2.

1	10	19	28	37	46	55	64	73	82	91
2	11	20	29	38	47	56	65	74	83	92
3	12	21	30	39	48	57	66	75	84	93
4	13	22	31	40	49	58	67	76	85	94
5	14	23	32	41	50	59	68	77	86	95
6	15	24	33	42	51	60	69	78	87	96
7	16	25	34	43	52	61	70	79	88	97
8	17	26	35	44	53	62	71	80	89	98
9	18	27	36	45	54	63	72	81	90	99

D. Please rate how positive you found the speech topic to be now.

/10.

E. Please rate how well you complied with the instructions that were given to you.

/10.

F. Please feel free to make any comments about the testing or the instructions.

Appendix C

INVESTIGATION INTO TYPES OF MENTATION

NAME;

I hereby consent to the experiment and give permission to use the obtained data in publication. I will not be identifiable as a participant in this experiment in any material published.

Signature:

Telephone:

Dear Participant,

Thank you for helping me with my research. I am investigating the processes involved in the suppression of different types of mentation as part of a project which will be used to complete a course requirement for a Master of Psychology (Clinical) at Edith Cowan University.

The experiment will take approximately 20 minutes. You will be asked to complete a questionnaire which will ask you about thoughts and feelings you may have experienced in the past week. Then you will be asked to think about or to imagine a vivid object that is personally relevant to you. You will then be asked not to think about the nominated object for a period of five minutes. You will then be asked to relax for a brief period. If you indicate in the questionnaire that you are contemplating suicide, then you may be contacted and referred to a counselling service. You will not be contacted under any other circumstances, but if you have any questions related to these questionnaires then you may contact the experimenter.

This research will help us to understand thought processes. Should you have any questions or concerns about the experiment, immediately after the experiment or subsequently, then do not hesitate to contact me care of the School of Psychology, Joondalup Campus, Joondalup. You are reminded that you can withdraw from the project at any time. Your participation is voluntary. Your participation (or withdrawal) will have no bearing on your enrolment. Your name and a contact number is required, but all identifying data will be removed from the experimental data. If you choose to submit a questionnaire without your name, then filling in and submitting the questionnaire will be taken as consent to the experiment.

Yours faithfully,

Jacinta Willans

A/Professor Helmes

Appendix D
Psychometric Instruments Used as Measures of
Covariance.

Beck Anxiety Inventory
Beck Depression Inventory.
Maudsley Obsessive Compulsive Inventory

Beck Anxiety Inventory

Instructions

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an [X] in the corresponding space in the column next to each symptom.

	NOT AT ALL	MILDLY It did not bother me much	MODERATELY It was very unpleasant, but I could stand it	SEVERELY I could barely stand it
1. Numbness or tingling				
2. Feeling hot.				
3. Wobbliness in legs.				
4. Unable to relax.				
5. Fear of the worst.				
6. Dizzy or lightheaded				
7. Heart pounding or racing.				
8. Unsteady.				
9. Terrified.				
10. Nervous.				
11. Feelings of choking.				
12. Hands trembling.				
13. Shaky.				
14. Fear of losing control.				
15. Difficulty breathing.				
16. Fear of dying.				
17. Scared.				
18. Indigestion or discomfort in abdomen.				
19. Faint.				
20. Face flushing.				
21. Sweating [not due to heat].				

Beck Depression Inventory

Instructions:

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling over the PAST WEEK, INCLUDING TODAY. Circle the number beside the statement you picked. If several statements in a group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

- | | |
|--|---|
| 1. 0 I do not feel sad. | 12. 0 I have not lost interest in other people. |
| 1 I feel sad. | 1 I am less interested in other people than I used to be. |
| 2 I am sad all time and I can't snap out of it. | 2 I have lost most of my interest in other people. |
| 3 I am so sad or unhappy that I can't stand it. | 3 I have lost all of my interest in other people. |
| 2. 0 I am not particularly discouraged about the future. | 13. 0 I make decisions about as well as I ever could. |
| 1 I feel discouraged about the future. | 1 I put off making decisions more than I used to. |
| 2 I feel I have nothing to look forward to. | 2 I have greater difficulty in making decisions than before. |
| 3 I feel that the future is hopeless and that things cannot improve. | 3 I can't make decisions at all anymore. |
| 3. 0 I do not feel like a failure. | 14. 0 I don't feel I look any worse than I used to. |
| 1 I feel I have failed more than the average person. | 1 I am worried that I am looking old or unattractive. |
| 2 As I look back on my life, all I can see are a lot of failures. | 2 I feel that there are permanent changes in my appearance that make me look unattractive. |
| 3 I feel I am a complete failure as a person. | 3 I believe that I look ugly. |
| 4. 0 I get as much satisfaction out of things as I used to. | 15. 0 I can work about as well as before. |
| 1 I don't enjoy things the way I used to. | 1 It takes an extra effort to get started at doing something. |
| 2 I don't get real satisfaction out of anything anymore. | 2 I have to push myself very hard to do anything. |
| 3 I am dissatisfied or bored with everything. | 3 I can't do any work at all. |
| 5. 0 I don't feel particularly guilty. | 16. 0 I can sleep as well as usual. |
| 1 I feel guilty a good part of the time. | 1 I don't sleep as well as I used to. |
| 2 I feel quite guilty most of the time. | 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep. |
| 3 I feel guilty all of the time. | 3 I wake up several hours earlier than usual and cannot get back to sleep. |
| 6. 0 I don't feel I am being punished. | 17. 0 I don't get any more tired than usual. |
| 1 I feel I may be punished. | 1 I get tired more easily than I used to. |
| 2 I expect to be punished. | 2 I get tired from doing almost anything. |
| 3 I feel I am being punished. | 3 I am too tired to do anything. |
| 7. 0 I don't feel disappointed in myself. | 18. 0 My appetite is no worse than usual. |
| 1 I am disappointed in myself. | 1 My appetite is not as good as it used to be. |
| 2 I am disgusted with myself. | 2 My appetite is much worse now. |
| 3 I hate myself. | 3 I have no appetite at all anymore. |
| 8. 0 I don't feel I am any worse than anybody else. | 19. 0 I haven't lost much weight, if any, lately. |
| 1 I am critical of myself for my weaknesses or mistakes. | 1 I have lost more than 2.5 kilograms. |
| 2 I blame myself all the time for my faults. | 2 I have lost more than 5 kilograms. |
| 3 I blame myself for everything bad that happens. | 3 I have lost more than 7 kilograms. |
| 9. 0 I don't have any thoughts of killing myself. | 20. 0 I am no more worried about my health than usual. |
| 1 I have thoughts of killing myself, but I would not carry them out. | 1 I am worried about physical problems such as aches and pains, or upset stomach or constipation. |
| 2 I would like to kill myself. | 2 I am very worried about physical problems and its hard to think of much else. |
| 3 I would kill myself if I had the chance. | 3 I am so worried about my physical problems that I cannot think about anything else. |
| 10. 0 I don't cry anymore than usual. | 21. 0 I have not noticed any recent change in my interest in sex. |
| 1 I cry more now than I used to. | 1 I am less interested in sex than I used to be. |
| 2 I cry all the time now. | 2 I am much less interested in sex now. |
| 3 I used to be able to cry, but now I can't cry even though I want to. | 3 I have lost interest in sex completely. |
| 11. 0 I am no more irritated now than I ever am. | |
| 1 I get annoyed or irritated more easily than I used | |
| 2 I feel irritated all the time now. | |
| 3 I don't get irritated at all by the things that used to irritate me. | |

Instructions: Please answer each question by putting a circle around the 'True' or 'False' following the question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the question.

1 I avoid using public telephones because of possible contamination	True	False
2 I frequently get nasty thoughts and have difficulty in getting rid of them	True	False
3 I am more concerned than most people about honesty	True	False
4 I am often late because I can't seem to get through everything on time	True	False
5 I don't worry unduly about contamination if I touch an animal	True	False
6 I frequently have to check things (e.g. gas or water taps, doors, etc.) several times	True	False
7 I have a very strict conscience	True	False
8 I find that almost every day I am upset by unpleasant thoughts that come into my mind against my will	True	False
9 I do not unduly worry if I accidentally bump into somebody.	True	False
10 I usually have serious doubts about the simple everyday things I do	True	False
11 Neither of my parents was very strict during my childhood	True	False
12 I tend to get behind in my work because I repeat things over and over again.	True	False
13 I use only an average amount of soap	True	False
14 Some numbers are extremely unlucky	True	False
15 I do not check letters over and over again before posting them	True	False
16 I do not take a long time to dress in the morning	True	False
17 I am not excessively concerned about cleanliness	True	False
18 One of my major problems is that I pay too much attention to detail	True	False
19 I can use well-kept toilets without any hesitation	True	False
20 My major problem is repeated checking	True	False
21 I am not unduly concerned about cleanliness	True	False
22 I do not tend to check things more than one	True	False
23 I do not stick to a very strict routine when doing ordinary things	True	False
24 My hands do not feel dirty after touching money	True	False
25 I don't usually count when doing a routine task	True	False
26 I take rather a long time to complete my washing in the morning	True	False
27 I do not use a great deal of antiseptics	True	False
28 I spend a lot of time every day checking things over and over again	True	False
29 Hanging and folding my clothes at night does not take up a lot of time	True	False
30 Even when I do something very carefully I often feel that it is not quite right	True	False

Appendix E

ANCOVA Table

Source	df	Sum of squares	Mean square	F	Observed power
Between Subjects					
Intercept	1	1472.381	1472.381	30.662	1.000
BAI	1	5.439	5.439	.113	.063
BDI	1	39.802	39.802	.829	.146
MOCI	1	19.579	19.579	.408	.096
Mentation	1	70.451	70.451	1.467	.223
Valence	1	33.597	33.597	.700	.131
Mentation by Valence	1	24.861	24.861	.518	.109
Error	67	3217.291	48.019		
Within Subjects					
Thought Instruction	1	22.337	22.337	1.241	.196
Thought Instruction by BAI	1	.342	.342	.019	.052
Thought Instruction by BDI	1	15.420	15.420	.858	.150
Thought Instruction by MOCI	1	1.702	1.702	.759	.061
Thought Instruction by Mentation	1	164.577	164.577	9.145**	.846
Thought Instruction by Valence	1	71.217	71.217	3.957	.500
Thought Instruction by Mentation by Valence	1	10.706	10.706	.595	.118
Error	67	1205.821	17.997		

Note * $p < .05$. ** $p < .01$.