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THE COGNITIVE AND AFFECTIVE REPERCUSSIONS OF

THOUGHT SUPPRESSION FOLLOWING

NEGATIVE PERSONAL FEEDBACK

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NEGATIVE PERSONAL FEEDBACK

by

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Dedication

This dissertation is dedicated to the memory of Richard M. Wenzlaff, without whose support and expertise this project would not have been possible. Dr. Wenzlaff was a great teacher, researcher, and mentor. He has been greatly missed.

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THE COGNITIVE AND AFFECTIVE REPERCUSSIONS OF THOUGHT

SUPPRESSION FOLLOWING NEGATIVE PERSONAL FEEDBACK

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Past research into the utility of Wegner's (1994) "Ironic Processes" theory of mental control for understanding depression vulnerability has demonstrated that thought suppression causes a heightened accessibility of unwanted negative thoughts during suppression, as well as paradoxical effects on post-suppression mood. However, researchers have failed to find that suppression causes the types of intrusive thoughts common to depression. To simulate the type of negative event that could trigger such depression-relevant self-referent thoughts, 76 nondepressed college students were given bogus negative feedback on a purported test of social competence. Participants were then randomly assigned to one of four conditions in which they either *suppressed* or *expressed* their reactions to the feedback, *concentrated* on a previously described memory of

positive feedback, or were given "*free-monitor" control* instructions. Thought contents and affect were assessed using self-report measures and five-minute verbal "think-aloud" tasks, first while mental control was attempted, and again after being released from mental control instructions. Two judges counted the number of references to the feedback and rated the valence of thought content in the verbal reports. The results revealed that those who had suppressed their thoughts experienced a greater number of test feedback thoughts following cessation of mental control than did the expression or control conditions. Thus, this study is the first to demonstrate post-suppression intrusions of unwanted thoughts about a personally-relevant negative event. Additional findings supported previous research showing that suppression creates a bond between unwanted thoughts and mood context (Wenzlaff, Wegner, & Klein, 1991), and demonstrated that post-suppression thought intrusions are associated with depressive affect. The results also showed that those who had been instructed to express thoughts about the test feedback subsequently reported the least thoughts about it, and that only those who had concentrated on a positive feedback memory during mental control later reported increased positive affect at the end of the experiment. These findings offer some insight into the role of suppression in the formation of depressive preoccupations and affect, and provide some support for the therapeutic benefits of expression and positively-focused concentration.

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Chapter I: **Introduction**

It is an unfortunate fact that many people find themselves plagued with thoughts they find distressing and hard to control. We all may experience unwanted intrusive thoughts at one time or another. Often they may be triggered by some negative external event, such as a perceived social slight or a near-accident experienced on the way to work, and sometimes they may occur seemingly spontaneously, like ruminations about a deceased loved one (Rachman, 1981). These unwanted thoughts are typically associated with dysphoric or anxious affect, quickly grab our attention, and are difficult to ignore (Edwards & Dickerson, 1987; Purdon, 2005). For people who suffer from clinical disorders, such as depression, OCD, or PTSD, coping with intrusive thoughts and images may be even more challenging because they tend to be experienced more intensely and frequently (Rachman & de Silva, 1978).

Because of the disturbing and distracting nature of intrusive thoughts we may feel compelled to take control over them in hopes of regaining our general sense of well-being. Often our efforts at controlling our thoughts may involve some attempts to avoid experiencing them. Cognitive avoidance, which involves refocusing attention away from an unwanted mental experience, has proven a popular form of mental control for clinical and nonclinical populations alike (Rachman & de Silva, 1978; Wenzlaff & Wegner, 1990; cf. Wenzlaff, 1993). And, the relative popularity of cognitive avoidance strategies, such as suppression of unwanted thoughts, may be traced to their apparent success under normal conditions. However, the removal of unwanted thoughts becomes more difficult the more distressing the intrusive thought or the more dysphoric one's mood (Rachman, 1981). Additionally, suppression has been shown to enhance the accessibility of

unwanted thoughts and associated emotions, paradoxically causing the very intrusions and negative mood that we may have been trying to avoid (e.g., Wenzlaff & Wegner, 2000).

Wegner (1992, 1994) proposed that cognitive processes initiated during thought suppression keep the mind sensitive to the presence of unwanted thoughts, thereby maintaining their accessibility during and after suppression (see, Wegner & Smart, 1997). That is because, while one part of the mind seeks distraction from an unwanted thought, another part monitors for evidence that suppression of the thought has failed. Thus, this monitor can keep the unwanted thoughts accessible and available to intrude upon consciousness whenever suppression is not fully successful. Such failures of suppression may occur when someone experiences a negative mood, mental stress, or when efforts to suppress have been given up.

In a pivotal study of the counterintentional effects of suppression, Wegner, Schneider, Carter, and White (1987) demonstrated the enhancement of unwanted thoughts that occurs following suppression. Wegner and colleagues compared subjects' efforts to either suppress or express thoughts about a neutral stimulus – a "white bear" – while verbally reporting (think-aloud) on the thoughts that were going through their minds. Not unexpectedly, they found that those asked to express thoughts of a white bear reported more white bear thoughts than did those suppressing such thoughts. However, when suppressers were subsequently asked to express thoughts about the white bear during a second think-aloud task, they mentioned the white bear more often than did those who had earlier expressed white bear thoughts without prior suppression. Thus, they demonstrated how attempts to avoid consciously experiencing (suppressing)

unwanted thoughts may actually later result in a kind of conscious preoccupation with those thoughts, which is reflected in the automatic thought intrusions the subjects experienced following suppression. From the apparent preoccupation that occurred following suppression, Wegner and colleagues concluded that a tendency to avoid experiencing unwanted thoughts may underlie a range of psychological phenomena. These phenomena may include some of the cognitive, emotional, and behavioral symptoms observed in depression. In particular, suppression may cause the seemingly spontaneous negative thought intrusions that are commonly reported by depressed individuals (Wenzlaff, 2005).

Measures of intrusive thoughts show that depressed individuals report a greater frequency, intensity, and uncontrollability of unwanted thoughts than nondepressed individuals (Wenzlaff, 2005). The intrusive negative thoughts experienced during depression are often described as spontaneous and recurrent, and revolve around themes of personal loss, failure, guilt, hopelessness, suicidal ideation, or events and memories that confirm a negative self-evaluation (Wenzlaff, 1993, 2005; Purdon, 2005). Because they are distressing and attention consuming, they can exacerbate other depression symptoms and inhibit concentration efforts and one's ability to refocus attention on more positive thoughts that might have helped to alleviate depressive symptoms (Wenzlaff, 1993).

Within more traditional cognitive models of depression (e.g., Beck, 1976; Abramson, Metalsky, & Alloy, 1989), intrusive negative thoughts would be viewed as cognitive symptoms of underlying personality characteristics that may predispose someone to depressive symptoms (Wenzlaff, 2005). These and other affective and

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behavioral symptoms of depression are proposed to be a direct consequence of a negative belief system or attributional style that is fairly rigid and globally applied (Hollon & Beck, 1979; Abramson, Metalsky, & Alloy, 1989). In Beck's (1976) cognitive theory of depression this negative belief system represents a vulnerability to depression, which remains dormant during nondepressed periods, but can be activated when someone encounters a stressful life event relevant to his negative beliefs about himself. It is this activation of the underlying belief system that is supposed to produce the negative cognitive patterns observed in depression.

Cognitive therapy for depression has been developed around a central assumption that these negative cognitions can be accessed, and that modifying them can alleviate other affective and behavioral symptoms of depression (Beck, Rush, Shaw, & Emery, 1979). The general belief is that challenging the validity of intrusive thoughts and modifying the underlying beliefs can not only reduce current symptoms, but also vulnerability to the recurrence of depression (Sacco & Beck, 1995). However, Wegner (1994) has suggested in his theory of mental control that it is not these cognitive products that should be the primary focus of alteration, but the cognitive processes that produce the negative intrusions and affect observed during depression (see also, Wenzlaff & Wegner, 2000; Wenzlaff & Bates, 1998). A number of studies have reported that people who are depressed or identified as vulnerable to depression based upon depression history are more likely to use suppression for managing distressing thoughts and feelings (Wenzlaff & Bates, 1998; Rude & McCarthy, 2003; for a review, see Wenzlaff, 2005). During attempts at cognitive avoidance, depressed individuals are also more likely to distract themselves from unwanted thoughts by using other negatively-valenced mental

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contents, which have been found cause a resurgence of the original unwanted thoughts (Wenzlaff, Wegner, & Roper, 1988). The intrusions, or rebound, of unwanted thoughts following attempts to suppress them can result in feelings of distress and anxiety, which may precipitate a downward-spiraling cycle of renewed suppression efforts and intrusions (e.g., Roemer & Borkovec, 1994; Kelly & Kahn, 1994). Thus, the consequences of cognitive avoidance during a depressed mood may be the maintenance or even increase of depressive symptoms.

Wenzlaff and Wegner (2000) have proposed that a chronic tendency to suppress unwanted thoughts and emotions plays a direct causal role in the etiology and maintenance of depression. Cognitive avoidance has been found to produce intrusive thoughts and negative affect (e.g., Wegner & Erber, 1992; Kelly & Kahn, 1994), and some more recent studies have found that a tendency to suppress can predict depressive symptoms (e.g., Brewin, Reynolds, & Tata, 1999; Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002). However, cognitive theory predicts that depressive symptoms result from an interaction of a depressive belief system and personally meaningful negative events, but no studies have demonstrated that suppressing reactions to such experiences could produce similar results. Finding that suppression of reactions to negative personal events produces depressive cognitive and affective symptoms would better support claims that use of suppression as a coping strategy may predispose someone to depression vulnerability.

To better understand how mental control research can be applied to the prevention and treatment of depression, it is important to explore how alternative strategies to suppression impact reactions to negative experiences. Wegner (1994) proposes that in

contrast to avoiding unwanted mental experiences, someone could use an approach strategy of concentrating on positive experiences. And, there is some limited evidence supporting the efficacy of this strategy for reducing thought intrusions (Wenzlaff & Bates, 2000). Alternatively, someone might choose to express thoughts about the negative experience in order to process reactions to it. Evidence from research on written disclosure has suggested that expression could help reduce depressive symptoms, such as intrusive thoughts and depressed mood (for a review, see Sloan & Marx, 2004). However, within the mental control literature, expression has not been explored as a strategy with possible utility; rather, it has only typically been included in studies as an informative comparison condition (Wenzlaff & Wegner, 2000).

The present study sought to provide a clearer picture of how mental control strategies may differ in the extent to which they precipitate intrusive thoughts and depressive affect. Specifically, by presenting college students with personally meaningful negative feedback and manipulating the strategies they use to cope with the experience, this study allowed direct assessment of the consequences of these mental control strategies following a negative social event. It is hoped that the results of this study will shed more light upon the cognitive processes behind the range of responses that different individuals have to negative interpersonal experiences and other personally-meaningful stressful events. In particular, this study may provide greater insight into the role of mental control processes in depression vulnerability, while also offering some suggestions for how mental control research can be adapted to the prevention of depression.

Chapter II: **Review of the Literature**

In order to lay the groundwork for the presentation of the present study examining the effects of cognitive strategies for controlling reactions to a negative experience, I shall review the phenomena that have been associated with these strategies. The review will begin by presenting evidence of the counterintentional effects of suppression, as well as the often beneficial effects of alternate strategies. Next, it will review theoretical accounts for these phenomena and how they relate to research on depression vulnerability. Lastly, this chapter will cover methodological issues relevant to the design of the present study and mental control research in general.

Relative Effectiveness of Mental Control Strategies

Wegner (1994; Wegner & Wenzlaff, 1996) describes multiple routes through which someone could change their current unwanted mental state or contents. The three primary mental control strategies that have been most extensively researched include: 1) suppression, which involves the conscious avoidance of unwanted mental contents, 2) concentration, or focusing on the desired mental contents, and 3) expression, which involves talking or writing about the current unwanted mental state with the goal of achieving a better state of mind.

Each of these strategies has been found to produce different consequences for mental and emotional well-being, both during and following mental control efforts. Based upon this accumulated evidence, Wegner (1994) has proposed that the efficacy of these strategies may be associated with how they each differently allocate attention toward environmental and mental contents during attempts to change a current mental state. The result is that each strategy may be more or less effective at controlling

unwanted mental contents depending upon the circumstances under which mental control is attempted. Below is a review of some of the evidence that has revealed the different effects associated with each of these strategies.

Counterproductivity of Suppression

As was earlier stated, suppression involves the conscious avoidance of unwanted mental contents, which usually entails significant effort to search the environment and other mental contents for sources of distraction. Most of the research on mental control strategies has investigated the hypothesized ironic effects that suppression of unwanted thoughts and emotions has on our mental and emotional well-being. These investigations have been able to identify three main classes of suppression-related effects on both cognition and affect. These phenomena include the enhancement of unwanted suppression targets that is revealed as thought intrusions during mental stress, or cognitive load, occasionally in the absence of mental stress, and as the recurrence of suppression targets after suppression efforts have been given up.

Suppression under cognitive load. Wegner describes mental control as an effortful endeavor, requiring sufficient cognitive capacity to be successful. Conscious cognitive capacity is described as limited in its attentional and processing capabilities (e.g., Ingram, 1984b), which has implications for the amount of information that can be processed at any one time. Various forms of cognitive load have been employed in mental control research to inhibit mental control efforts by increasing performance demands on limited cognitive resources (e.g., Wegner, Erber, & Zanakos, 1993; Wenzlaff & Bates, 2000; also, for reviews see Wegner, 1994; and Ingram, Miranda, & Segal, 1998). Common forms of cognitive load include the pressure to perform a task in a limited amount of time

(e.g., Wegner & Erber, 1992), and the use of concurrent memory loads, such as rehearsing a multiple-digit number in memory while performing a primary task (e.g., Wenzlaff & Bates, 1998; 2000).

A variety of studies have demonstrated that suppression is especially susceptible to failure when mental resources are depleted. Research has shown that the disruption of suppression efforts through some form of cognitive load can ironically enhance the accessibility of unwanted thoughts and emotions (for a review, see Wenzlaff & Wegner, 2000). For example, Wegner, Erber, & Zanakos (1993, Exp. 1) instructed subjects to recall either sad or happy life events, while concurrently either trying to feel the event-congruent mood (i.e., sad or happy mood) or avoid feeling the mood. Half of the subjects were also asked to maintain a 9-digit number in memory as a cognitive load manipulation while thinking about the event and attempting mood control. Subjects who were asked to maintain a concurrent memory load experienced mood and thoughts that were opposite the intended direction of mood control. In other words, cognitive stress inhibited mood control efforts to the extent that someone trying to feel happy, for example, might have been unable to make their mood happy, and alternatively might have felt more sadness. Additionally, although the counterintentional effects of mood control under load were only marginal for subjects given instructions to feel the mood that was associated with the remembered events, the effect for those told to avoid feeling the related mood was significant. Subjects given instructions to feel the event-related mood experienced a mild increase in instruction-oppositional mood, whereas those asked to suppress a mood (e.g., sadness) experienced a sharp increase in that mood. Thus, mood suppression under

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cognitive load had the paradoxical effect of creating the exact mood state that they were trying to avoid.

When individuals are attempting to suppress a thought, cognitive load has also been found to increase the accessibility of the targeted thought. In a study conducted by Wegner and Erber (1992, Exp. 1) participants were instructed to think or not think about a target word (e.g., "home"). Then their tendency to respond to related cues (e.g., "house") and unrelated cues (e.g., "adult") was measured. Those who were suppressing under a concurrent cognitive load were more likely to respond with the target word to the cues than were the other participants. In a second study, Wegner and Erber (1992) also demonstrated increased accessibility under cognitive load using response latencies in a Stroop-type color-naming task. Investigators have observed similar results using other information processing measures (e.g., Wenzlaff & Bates, 2000; Wenzlaff, Rude, Taylor, Stultz, & Sweatt, 2001), and a variety of target thoughts, such as stereotypical material (Macrae, Bodenhausen, Milne, & Ford, 1997), abstract personality trait concepts (Newman, Duff, Hedberg, & Blitstein, 1996), thoughts about a painful separation (Mikulincer, Dolev, & Shaver, 2004), or depressive thought content (e.g., Wenzlaff & Bates, 1998; Wenzlaff et al., 2001).

Post-suppression rebound. An enhanced accessibility of unwanted thoughts has also been demonstrated in the recurrence, or "rebound," of the target thoughts after efforts to suppress those thoughts have been halted (see, Wenzlaff & Wegner, 2000). The resultant intrusive thoughts can occur when the context under which suppression originally occurred is recreated (e.g., Wegner et al., 1987; Wenzlaff, Wegner, & Roper, 1988). In Wenzlaff, Wegner, & Klein (1991), for example, subjects were musically

induced to experience either positive or negative moods, and were then asked to report their thoughts while trying either to think or not think about a white bear. In Experiment 1, those who had been initially asked to suppress thoughts of a white bear at Time 1 later experienced a rebound of white bear thoughts at Time 2, but only when the original mood in which they had been suppressing their thoughts was reinduced. In Experiment 2, subjects who had initially suppressed white bear thoughts during mood manipulation later reexperienced their original Time 1 mood when they were later asked to express thoughts of a white bear. However, subjects who had been asked to express thoughts of a white bear during mood manipulation at Time 1 experienced no such rebound of thoughts or mood at Time 2 in either Experiment 1 or 2.

Rebound has also been observed absent the use of such contextual associations. For instance, in their study of the mental control of emotionally-charged and emotionally-neutral personal thoughts, Wegner and Gold (1995, Exp. 2) asked subjects to either verbalize thoughts about an old flame (expression) or try not to think about an old flame (suppression) during a think-aloud procedure. Participants in the "hot flame" condition suppressed or expressed thoughts about a past relationship for which they experienced current longing, whereas those in the "cold flame" condition no longer experienced longings for the previous relationship. Following the initial manipulation think-aloud period, during which participants either suppressed or expressed their thoughts, all participants then later expressed thoughts about their old flames. The results of the experiment showed cognitive rebound for suppression, but only for those suppressing thoughts about a "cold flame." In other words, only those who had been asked to avoid

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thinking about an unwanted past relationship later experienced a resurgence of thoughts about that relationship when released from instructions to suppress.

Besides demonstrating post-suppression rebound of unwanted thoughts, the results of this experiment also demonstrated another suppression-related phenomenon – the deleterious effects of suppression on emotional well-being. During the experiment emotional arousal was assessed via a physiological measure of skin conductance level. Although the "hot flame" suppressers did not experience cognitive rebound of thoughts about their old flames, they did experience emotional arousal following suppression. Various other studies have before and since then observed similar post-suppression influences on affect and emotional arousal, including increased anxiety and depressive affect (e.g., Roemer & Borkovec, 1994; Borton, Markowitz, & Dieterich, 2005; Marcks & Woods, 2005), and decreased state self-esteem (Borton et al., 2005).

Suppression-related intrusions absent cognitive load. A less commonly reported outcome of attempting to suppress one's thoughts is the enhanced occurrence of unwanted thoughts during suppression, even in the absence of a cognitive load. Wegner and colleagues (1987), in their study comparing suppression and expression of thoughts about a white bear, noted that expressers always reported a greater number of target thoughts than did suppressers; however, suppression was never "complete." They noticed that suppressers still experienced brief intrusions of the target thoughts despite instructions to avoid such thoughts. A related effect was also observed by Harnden, McNally, and Jimerson (1997) in their study of the effects of mental control on preoccupations with weight. They also found that suppressers reported fewer target-related thoughts than did expressers, but they did find that dieters experienced more

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intrusive thoughts about weighing themselves than did nondieters. Finally, Lavy and van den Hout (1994) observed ironic effects without concurrent load on an information-processing task. Participants asked to suppress thoughts about numbers while performing a modified Stroop color-naming task exhibited greater response latencies to number words in the task than did a control group that was not given suppression instructions.

Concentration on Positive Thoughts

Although mental control research thus far has primarily focused on the ironic effects of suppression, results from these studies and from other theoretical accounts provide some evidence for alternate strategies of mental control that have been found to be less susceptible than suppression to control failure during mental stress and after mental control efforts are halted. Besides suppression, the strategy that has received the most attention in the mental control literature has been the concentration on desired outcomes during attempts to change a current undesired mental state (e.g., Wegner, 1994; Wegner & Wenzlaff, 1996).

One way that the effectiveness of concentration has been tested has been through the use of focused distraction during efforts to suppress an unwanted target thought. Some investigators have found that concentrating on a specific distracter thought during suppression reduces suppression-related intrusive thinking. For example, Wegner and associates (1987, Exp. 2) found that focusing on a specific distracter thought during the suppression of thoughts about a white bear attenuated the rebound effect during a later expression period. However, other investigators have found that focused distraction does not aid suppression efforts. Borton (2002) found that using a similar strategy of replacing each occurrence of an unwanted thought with a desired distracter thought is not effective.

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She reported that male participants initially instructed to replace each occurrence of a negative self-referent intrusive thought (NSRI's) with thoughts about a specific positive self-characteristic later experienced more NSRI's than did those who had initially expressed their NSRI's or who had received no mental control instructions. Thus, it remains unclear how effective concentration is when used during primary efforts to suppress.

Other investigators have attempted to assess the value of concentration on positive thoughts as a useful strategy in its own right, not as a supplement to suppression efforts. Wenzlaff and Bates (2000, Exp. 1) directly assessed the relative efficacy of concentration and suppression strategies for thought control under cognitive load. Subjects performed a Scrambled Sentence Task (Wenzlaff & Bates, 1998), which consists of 6-word scrambled statements that can be unscrambled to form either positive self-statements (e.g., "the future looks very bright") or depressive self-statements (e.g., "the future looks very dismal"). The task was performed either with a concurrent memory load of maintaining a 6-digit number in memory or with no concurrent load. Subjects received task instructions designed to semantically portray the goals of suppression and concentration strategies. They were instructed either to unscramble the sentences to form positive statements (concentration), avoid forming negative statements (suppression), or form whatever statements came to mind first (control). Without a concurrent memory load, subjects in the suppression and concentration conditions produced a lower percentage of negative statements than did those in the control group. With a concurrent memory load, though, subjects in the suppression group formed a significantly greater percentage of negative statements then either the control or concentration groups. Based

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upon these results it appears that a suppression strategy of mental control is more vulnerable than a concentration strategy to the ironic effects of control failure when mental resources are depleted.

In a second experiment, Wenzlaff and Bates (2000) also compared the effects of suppression and concentration strategies on thought content after mental control efforts have ceased. Study participants completed two different sets of the Scrambled Sentence Task. For the first set they received either concentration, suppression or control instructions. For the second set they received only control instructions. The results showed that for the first task, the concentration and suppression conditions produced similarly few negative statements when compared to control. However, for the second task, those previously asked to suppress negative thoughts produced a greater percentage of negative statements than did either control or concentration condition subjects. In Experiment 3, these results were replicated with the added conditions in which subjects suppressed positive thoughts or concentrated on negative thoughts. Again, only those previously asked to suppress negative or positive thoughts experienced cognitive rebound on the second set of sentences.

Expression of Unwanted Thoughts

Many of the earlier mentioned studies of mental control compared the effects of suppression to the expression of thoughts or emotions. Rather than examining the relative benefits of expressing thoughts or emotions versus suppressing them, they used expression more as an informative comparison condition for the effects of suppression (e.g., Wegner & Gold, 1995; for a review, see Wenzlaff & Wegner, 2000). Thus, much of the evidence for the effects of expression in the mental control literature is based upon

how it contrasts with suppression. Within this body of evidence two main cognitive effects of expression have been observed – first, that cognitive load during expression does not cause an increase of targeted thought content, and second, that target thoughts decline, relative to baseline or suppression conditions, after expression has ceased. Some studies have also reported beneficial effects of expression on affect. For instance, in a study performed by Roemer and Borkovec (1994), participants who were asked to suppress and then later express thoughts about a self-generated depressing, anxious, or neutral situation reported increased anxiety at the end of the study, whereas those who had initially expressed those thoughts experienced a decline in anxiety.

Mental control research demonstrating the emotional benefits of expression is consistent with research on written disclosure. Pennebaker (1989) stated that suppression tends to be associated with increased illness and subjective distress, whereas the expression of emotion may tend to lead to more positive health outcomes. Petrie, Booth, and Pennebaker (1998) further explored these predictions in a study of emotional expression and thought suppression. For three days they instructed medical students to either write about what occurred over the past day (24 hours) or about a personally meaningful emotional issue. Each day they were asked either to suppress or reflect on their thoughts following the writing periods. Concerning the consequences for health, they found that thought suppression had negative consequences for immune functioning (e.g. decreased total lymphocytes), whereas emotional expression through writing had the opposite effect (e.g., increased total lymphocytes). Finally, in an eighth week follow-up, they discovered that those who had expressed thoughts about an emotional issue later expressed greater overall happiness than did suppressers.

Summary

The accumulated evidence on mental control strategies, dating back to the earliest studies demonstrating the rebound of white bear thoughts following suppression (e.g., Wegner et al., 1987), has with a fair degree of consistency demonstrated that the results of thought or mood suppression are often counterintentional. Specifically, suppression has been found to increase the accessibility of unwanted thought content, resulting in intrusive thoughts during suppression, either with or without additional mental stress, and after suppression efforts are halted. Suppression has also been found to have emotional consequences, as is evident in post-suppression emotional arousal and the resurgence of previously suppressed mood. Although research demonstrating the effects of concentration has been limited and mixed, it appears that concentration may at a minimum be less likely than suppression to cause intrusive thinking during and following mental control efforts. Similar results have been observed for expression, with the added possibility that expression may have benefits for emotional well-being.

Ironic Processes Theory of Mental Control

Daniel Wegner first began articulating a theory behind the phenomena associated with suppression by focusing on mental control processes initially considered unique to suppression (Wegner, 1989; 1992). He described a suppression cycle involving the continual interaction between an unfocused search for environmental or mental contents that would distract someone from the target of their suppression efforts, and an opposing search process that signaled occurrences of the very thoughts someone was trying to avoid. This "automatic target search" was proposed to produce the counterintentional

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effects of thought suppression whenever the "controlled distracter search" was disabled or stopped.

The Process of Mental Control

Wegner (1994) fine-tuned his explanations of the suppression cycle and expanded his discussion to account for the effects of alternate cognitive strategies, with the result being the "Ironic Processes" theory of mental control, which describes the mental processes involved in our attempts to regulate our thoughts and behaviors. Wegner (1992) explained that the endeavor of mental control involves "conscious attempts to control psychological contents and processes" (p.193). Thus, the process of mental control begins with the conscious goal to change a current mental state (Wegner, 1994), which might represent a range of experiences, from basic emotions (e.g., sadness), to various cognitive states (e.g., concentration), and may include more specific states depending upon the targets of someone's thoughts or emotions (Wegner & Wenzlaff, 1996). So, for example, someone may set a goal of changing an undesirable mental state, such as when experiencing a sad mood or disturbing and intrusive thoughts, or when wanting to prevent the external expression of a thought (Wegner 1992, 1994; Wenzlaff & Wegner, 1996). When a goal is set, a "state selection process" is triggered by the noted discrepancy between a current mental state (e.g., sadness or nervousness) and a desired mental state (e.g., happiness or relaxation) (Wegner & Wenzlaff, 1996). Although the process is typically automatically activated by specific situations, a chronic tendency to prefer certain states of mind is considered to form stable personality dispositions that can influence individual efforts of mental control (Wegner & Zanakos, 1994).

Mental control processes. When the goal to change the current mental state is set, mental control processes are enacted to implement the goal. Their role is to "mediate between preconscious sensory and memory inputs and their conscious representations" (Wegner & Wenzlaff, 1996, p.471), thereby only allowing contents relevant to the desired state change to reach consciousness. Two specific mental control processes are enacted - one to create the desired change, and another to check that the desired change has been achieved (Wegner, 1994; Wegner & Wenzlaff, 1996). The first, an "intentional operating process," searches for mental contents that will produce the desired change in mental state. This effortful process is consciously guided and produces the desired mental state change by filling the mind with thoughts and images consistent with the desired change. In contrast, the "ironic monitoring process" seeks mental contents that signal failure to achieve the desired change in mental state. This process runs automatically beneath consciousness and serves to reactivate the operating process upon location of preconscious mental contents indicating failure of the operating process to achieve the desired change in mental state. Thus, it keeps the mind sensitive to cognitions indicative of control failure. Both processes cease operation only after the desired change of mental state has been achieved, or when the desire for change has been given-up or forgotten.

Mental Control Strategies. Wegner (1994) proposed that different mental control strategies can be applied to achieve a desired change of mental state. The particular strategies implemented by the mental control processes are dependent upon how the goal of the state selection process is framed. One might either seek to achieve a desired state (e.g., happiness) or seek to avoid an undesired state (e.g., sadness). The first goal enacts an approach, or directive, strategy (concentration), in which the operating process

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performs a targeted search for mental contents consistent with the desired state (e.g., happy thoughts), and the monitoring process performs a broad search for contents inconsistent with the desired state (e.g., sad thoughts) and thoughts that may be neutral or goal-irrelevant. In seeking to avoid an undesired state, an avoidance strategy (suppression) is enacted. In this case, the operating process performs a broad search for thoughts that represent anything besides the undesired state (e.g., non-sad thoughts), and the automatic monitoring process performs a targeted search for thoughts consistent with the undesired state (e.g., sad thoughts).

In contrast to the simple approach or avoidance goals of the above described concentration and suppression strategies, the use of expression to achieve a desired change of mental state may actually involve a more complex form of an approach strategy (Wenzlaff & Bates, 1998). Although the strategy of expressing unwanted thoughts and feelings has not been specifically defined in mental control literature, it is likely that expression requires the integration of interpretive strategies with the intent to approach a desired mental state (Wegner & Wenzlaff, 1996). Interpretive strategies have been described a kind of mental filter someone might use to impact how they perceive a given experience. Without the use of interpretive strategies, simply attempting to attain a desirable state of mind (e.g., happiness) by expressing, or focusing attention upon, the current undesired mental state (e.g., sadness) may produce a state like depressive rumination (e.g., Nolen-Hoeksema, 1998). However, by shifting the way one interprets or attends to the current undesired state (e.g., finding the good in a bad situation), someone's focus on the undesired state may actually facilitate progress toward a desired state. Such constructive expression of target thoughts may be more consistent with the type of

expression described in literature on the therapeutic uses of disclosure (see, Pennebaker, 1989).

Mental Control and Cognitive Capacity

Because of the limitations on conscious processing capacity, a primary determinant of the amount of information that can be processed at one time is the amount of effort or attention it requires. Limited capacity will have a larger impact on controlled processes, which require more attentional resources, than it will on automatic processes. Controlled processes in information-processing refer to "the volitional component of information-processing" (Ingram, 1984b, p.463), which requires conscious intent and effort for operation. In Wegner's (1994) descriptions of mental control processes, the intentional operating process that works to achieve a change of mental state is considered a controlled process. In contrast, automatic processes are autonomous and relatively unconscious, as a result of frequent operation and consistent application over time within specific situations (Wegner, 1994; Wegner & Wenzlaff, 1996; Wenzlaff, 1993). The ironic monitoring process that watches for evidence that mental states have not changed is described as an automatic process.

"Ironic" monitor and cognitive load. The effortful nature of mental control makes it susceptible to conditions that reduce cognitive capacity. Wegner (1994) explains that under normal conditions, a desired change of mental state can be achieved because the operating process, as a consciously-guided process, is more proficient than the automatic monitoring process (Wegner, 1994; Wegner & Wenzlaff, 1996). However, the "ironic effects" of the automatic monitoring process may be experienced whenever mental capacity is taxed in some manner. Because the effortful operating process requires greater

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mental effort than the automatic monitoring process, it is more vulnerable to failure whenever cognitive resources are depleted. The irony of mental control occurs because the monitoring process' search increases the accessibility of thoughts inconsistent with a desired change of mental state. Therefore, when mental resources are depleted, attempts to achieve the desired state change may ironically result in the opposite effect of maintaining or even intensifying the undesired state. This effect occurs because thoughts representing control failure, and therefore in opposition to the desired state change, are what the monitoring process fills the mind with when the operating process fails in its attempts to find mental contents consistent with the desired state change. Thus attempts to control states such as food cravings or negative mood during stress may actually inhibit efforts to block food thoughts or attain a positive mood.

Mental control strategies and cognitive load. Ordinarily, when mental control is attempted both suppression (i.e., avoid an undesirable state) and concentration (i.e., approach a desired state) strategies should be effective for producing a desired change of mental state. Thus, if the current goal is to change a sad mood-state, the operating processes for both strategies should successfully fill the mind with contents that would result in an improved mood. However, the ironic effects of mental control efforts under cognitive load have different consequences for the two strategies. When cognitive resources are depleted, the broadly searching monitoring process in a directive strategy would fill the mind with contents ranging from sad content to neutral and irrelevant content. This should result in only a slight increase of sad mood or decrease of positive mood because the effects of the sad thought content are diluted. Because the monitoring process in suppression performs a targeted search for thoughts consistent with the sad

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mood-state, control failure would specifically result in sad thought content filling the mind. The undiluted presence of sad thoughts should produce a sharp increase in sad mood. Therefore, the ironic effects of mental control failure under cognitive load would be stronger after suppression failure than after concentration failure.

The hyperaccessibility that the suppression monitoring process creates for unwanted mental contents has been well established in the earlier discussed studies. In review, research has shown that cognitive load reveals an increased accessibility of suppression targets relative to concentration (Wegner & Erber, 1992; Wenzlaff & Bates, 2000), can result in experiences of mood-states contrary to the intended directions of mood change (Wegner, Erber, & Zanakos, 1993), and can cause an enhanced recall of target thoughts (Macrae et al, 1997). However, approach strategies of mental control have also been reported to cause the ironic enhancement of unwanted mental contents, which is revealed during mental stress. For example, Wegner and associates (1993) noticed that those asked to focus on a given mood experienced marginal increases in the opposite mood when under cognitive stress, in contrast to the sharp increases experienced by suppressers. Such findings provide evidence for the claim that the automatic monitor in approach strategies employs a broad search for evidence of control failure. Relative to all the available mental contents that might be accessed during such a broad search, occurrences of unwanted thought content may be few, but they are present, accessible, and able to signal mental control failure.

Mental Control and Associative Networks

Intrusions of unwanted thoughts during suppression can contribute to the resurgence of those thoughts after mental control is given up. Wegner and Gold (1995)

stated that one explanation for such cognitive rebound is that suppression can serve to increase the association between thoughts targeted for suppression and the context in which those thoughts are suppressed, to the extent that later expression or reinduction of one (e.g., sad mood) will trigger the other (e.g., associated thoughts), and vice versa (Wenzlaff, Wegner, & Klein, 1991; Wenzlaff, 1993). This "association hypothesis" is consistent with network theories in which there is a proposed interconnection between cognitive and affective information within mental structures (Bower, 1981). Within this network, activation of one type of content, such as negative thoughts, increases the probability of related content, such as sad affect, being activated. The stronger the link between associated concepts, the greater the probability that activating one concept will result in activation of a related concept (Ingram, 1984b).

Context and thought intrusions. Suppression creates and strengthens a bond between target thoughts and context both because of the unfocused search for distracters and because of the hyperaccessibility of the monitored target thought. The unfocused distracter search creates this bond because, in contrast to a targeted search for distracters in a concentration strategy, someone suppressing a thought or mood focuses more on context to aid their broad search for distracters (Wegner, 1992; Wenzlaff, 1993). Each intrusion of unwanted mental contents immediately results in renewed efforts to think of something else, thereby strengthening associations between the unwanted contents and chosen distracters through frequent priming of the unwanted thoughts in temporal contiguity with the distracters. As an example, in the Wenzlaff and Bates (2000, Exp's 2 & 3) study assessing post-suppression rebound of negative or positive thoughts, the process of suppressing thoughts occurred within the context of the Scrambled Sentence

Task; therefore, reexperiencing the same task context may have accounted for a rebound of the previously suppressed thought content.

As some researchers have found, suppression can sometimes cause more intrusions to occur than would be experienced during concentration efforts or if no mental control had been attempted at all (e.g., Harnden et al., 1997; Lavy & van den Hout, 1994). The frequent intrusions of unwanted thoughts during suppression provide more opportunities for a bond between thought and context to occur. However, the occurrence of the target thoughts alone is not sufficient to strengthen associations with contextual cues (e.g., Wegner & Gold, 1995). For instance, when someone intentionally expresses their thoughts, they may report more target thoughts than if they had suppressed, but they are not searching for distracters. Thus, no bond between the targeted thoughts and context occurs.

Bonding of thought and mood. Of particular interest to research on mood disorders is how suppression can intensify the bond between unwanted thoughts and the emotional context in which they were suppressed. Researchers have long ago established the link between cognition and affect. Some have found that inducing positive or negative thought contents through procedures like the Velten Mood Induction Procedure (VMIP; Velten, 1968) results in a similar shift in affect (for a review, see Sacco & Beck, 1995). Others have found that modifying dysfunctional thinking in depressed clients results in the reduction of self-reported depressed mood (e.g., Teasdale & Fennell, 1982). But, research on suppression has also found that even relatively neutral thoughts can trigger changes in mood. In an earlier described study by Wenzlaff and associates (1991), simply expressing thoughts about a white bear, which had been previously suppressed during

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mood manipulation, was sufficient to cause a recurrence of manipulated mood. They also found that higher numbers of intrusions of white bear thoughts during suppression was associated with greater mood rebound after suppression efforts ceased, supporting their claims that the cycle of intrusions and distraction that occurs during suppression is responsible for the rebound effect. The authors noted that the expression group did not experience rebound because expression does not create the target-context bond between emotion and thought. As further evidence of this, they observed that thoughts reported during expression tended to be less mood-relevant following the mood priming than were those reported during suppression.

Mental Control and Cognitive Activation

Although the associations formed between suppressed thoughts and the context in which they were suppressed may explain rebound of thoughts or emotions when the other part of the association is present, Wegner and Gold (1995) proposed that associations do not sufficiently explain all instances of cognitive or emotional rebound. They used an "accessibility hypothesis," to explain results obtained in their study of mental control of emotionally-charged and emotionally-neutral personal thoughts (Wegner & Gold, 1995, Exp. 2). According to an association explanation of rebound, the emotional rebound experienced by those suppressing "hot flame" memories should only have occurred if there had been a measurable rebound of cognitive intrusions to trigger the associated emotions. However, there was no cognitive rebound of "hot flame" memories. The authors concluded that the emotional arousal experienced following suppression of "hot flame" thoughts can be explained by the subconscious accessibility of those thoughts and occasional intrusions of the "hot flame" cognitions that remained available to activate

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associated emotions. The subconscious accessibility of those thoughts was later described by Wegner and Smart (1997) as a state of deep cognitive activation that is created by the ironic monitoring process.

Levels of Cognitive Activation. Drawing on research into conscious thought and the accessibility of mental contents, Wegner and Smart (1997) suggested that that there are two main ways of determining if a thought is active: When a thought is consciously reportable, it is considered active. Also, a thought may be considered active when it is subconsciously accessible, to the extent that it is not consciously reportable but is able to influence information processes and trigger activation of associated thoughts.

The various interactions of conscious awareness of the thought and unconscious accessibility create levels of cognitive activation ranging from full activation to inactivation. "Full activation" of a thought occurs when consciousness is preoccupied with experiencing the thought, and the thought is subconsciously ready to keep entering consciousness. This type of activation is proposed to most likely occur for pleasant thought topics (e.g., love, success). "Surface activation" occurs when a thought is present in consciousness, but has not achieved a high degree of accessibility. Such activation may be more likely when someone is consciously focusing on an uninteresting topic, such as a long technical text or a bare wall, but may not be fully engaged in the awareness of it. Thoughts achieving only surface activation are not likely to influence other thought processes. Lastly, "deep cognitive activation" involves highly accessible thought content that may constantly be ready to enter into conscious thought. It remains unconscious, but influential on information processes and other reported thoughts, emotions, and behavior. Though many kinds of thoughts may often linger in this state, someone is more likely to

be motivated to keep highly accessible negative thoughts (e.g., "I'm a failure") from attaining consciousness.

Ironic activation. Mental contents may be activated merely because of the perception of some associated external stimuli, because they are already chronically accessible, or because of conscious intent to access them, as is the case with intentional mental control. The intentional operating process's search for mental contents consistent with a desired change of mental state produces full cognitive activation of relevant mental contents. The counterintentional effects of mental control may occur through another form of activation described as "ironic activation." Because suppression involves the enactment of an automatic process to monitor for mental contents inconsistent with an intended goal-state, it produces an eventual state of deep cognitive activation in which monitored thoughts are accessible but not conscious. "Ironic" activation has also been described as the hyperaccessibility of suppressed thoughts that the monitor maintains during suppression and after suppression efforts have ceased (Wegner & Gold, 1995). Because the unwanted mental contents are activated, or hyperaccessible, they can easily influence conscious thought when cued, or when conscious control efforts are inhibited or halted, contributing to the ironic effects of suppression, which include intrusive thoughts and emotional arousal.

Of additional note is the relationship between cognitive activation and expression. Because expression causes fully conscious cognitive activation of target thoughts, it would not be expected to lead to the negative consequences of deep activation (i.e., intensification of emotions, intrusive thoughts). The goals of expression are framed as an approach strategy, wherein an operating process seeks out thoughts relevant to a current

problem (e.g., a negative event), while the monitoring process identifies thoughts

irrelevant to or inconsistent with the focus of mental control. Thus, any influences that

the accessibility of monitored thoughts would have on conscious thought during and

following expression would be negligible.

   "Ironic" activation and intrusive thoughts. A primary consequence of deep

cognitive activation that deserves expanded discussion is the occurrence of intrusive

thoughts. They may take the form of direct intrusions that are clearly related to the

thought being avoided, or indirect intrusions that result from the subconsciously active

thought activating and achieving conscious expression through thematically associated

cognitions (Wegner & Smart, 1997). Because of strong associations with affect and the

often self-referent nature of intrusive thoughts, they are generally harder to dismiss than

neutral thoughts, particularly when in a dysphoric mood (Edwards & Dickerson, 1987).

And, although intrusive thoughts can be pleasant or unpleasant, they are most often

unpleasant and associated with emotional distress (Kelly & Kahn, 1994).

   Several studies have examined various characteristics of intrusive thoughts and

deep cognitive activation. In one experiment, Howell and Conway (1992, Exp. 1)

investigated the impact of negative and positive mood-states on people's abilities to avoid

thinking about personally relevant positive or negative life events. They found that

intrusions of thoughts about the events exhibited mood-congruent effects (e.g., more

negative than positive intrusions occurred in the negative mood). In a study assessing the

relative difficulty of disattending to and replacing intrusive or neutral thoughts, Edwards

and Dickerson (1987) timed subjects while they formed and then replaced neutral and

personal intrusive thoughts. They found that subjects took more time to change their

attention away from intrusive thoughts than from neutral thoughts. This study suggests that it may be especially difficult to distract oneself when trying to control intrusive thoughts. A final study, conducted by Roemer and Borkovec (1994), demonstrated the indirect activation that may occur when thoughts are deeply activated. They asked study participants to report their thoughts while avoiding or expressing thoughts about a self-generated neutral, anxious, or depressing situation. They found that those who were avoiding conscious experience of anxious situations still experienced thoughts indirectly associated with them. Thus, the subconscious accessibility of the anxious situation facilitated conscious activation of thoughts that may have been thematically or affectively related to the original target thoughts.

Deep activation and priming frequency. Macrae, Bodenhausen, Milne, and Jetten (1994) have further suggested that the rebound following suppression is not simply due to the attainment of deep cognitive activation, but also due to the frequency of priming that occurs for the target thoughts. They describe suppression as a cycle of detection (consciously or subconsciously) and inhibition of mental contents that causes repetitive priming for the target thought. Because of this cycle, it is suggested that suppression targets are more frequently accessed or primed than if the thoughts were expressed, thus resulting in a slower decay of excitation level for suppressed than for expressed thoughts. Therefore, suppression targets would be accessible longer after mental control efforts have stopped.

Macrae and colleagues (1994) demonstrated this "facilitatory priming effect" for suppression in a series of three experiments on the mental control of stereotype memories. In each of the experiments they had participants write briefly about a day in

the life of a pictured person intended to prime the stereotype of a "skinhead." Half of them were given instructions intended to promote suppression of that stereotype while writing the story, and the other half received no special instructions. In the first experiment the authors observed a post-suppression rebound of stereotyped thoughts in the stories written about a second pictured person whose appearance was similar to the first. In the second study, post-suppression rebound was behaviorally observed by providing an opportunity for participants to sit in one of seven seats next to one where they were told the pictured "skinhead" was to be sitting. Those who had suppressed stereotype-related thoughts sat farther away than did control participants. Finally, in a third experiment, participants performed a lexical decision task in which they decided if a string of letters appearing on a computer screen was a word or nonword. Stereotype-suppressers responded more quickly to stereotype words than did nonsuppressers. Thus, in each of the three experiments, a post-suppression rebound in the form of stereotype-consistent thoughts, behaviors, and reaction times demonstrated the continued accessibility of stereotype thoughts.

"Ironic" activation and emotion. Keeping what may often be emotionally-charged thoughts out of consciousness has emotional, behavioral, and cognitive consequences that are especially relevant to some psychological disorders like depression. Some studies have found that deep cognitive activation can intensify the emotional impact of a thought. For instance, Wegner and Gold (1995) reported that students exhibited elevated emotional reactivity after trying to keep emotionally-charged memories of a past relationship ("hot flame") out of their conscious thoughts. Wegner and Smart (1997) also suggested that this intensified emotional impact caused by deep

activation of a thought may mean that its transition from deep to full cognitive activation "can be frightening, emotional, intrusive, and even vile" (p.992). The emotional distress caused by suppression-induced intrusive thoughts has been demonstrated in several of the earlier mentioned studies (e.g., Roemer & Borkovec, 1994; Kelly & Kahn, 1994). Such emotional impact associated with a thought may motivate further attempts at stopping the thoughts and preventing them from returning to consciousness, thus setting off a vicious cycle of attempted thought control and failure.

"Ironic effects" of mental control without cognitive load. The influence of "ironic" activation may help explain the paradoxical thought intrusions that can occur during suppression, even without concurrent cognitive load to disable mental control efforts. One reason for this occurrence may be that, when suppression is initiated, unwanted thoughts may frequently intrude upon consciousness until such time that the continued efforts of thought suppression yield deep cognitive activation (Wegner & Smart, 1997). These frequent intrusions may also reflect the frequent priming effect described by Macrae and colleagues (1994). Once deep cognitive activation is achieved, conscious intrusions are no longer occurring, and a cognitive load may be required to disrupt the controlled operating process' search for distracters while suppression is still ongoing (e.g., Wenzlaff & Bates, 1998; 2000).

Mental Control and Depression

Cognitive and emotional suppression may play a significant role in the etiology and maintenance of depression. The integration of findings from mental control research with cognitive theories of depression may provide clearer explanations for the emotional and cognitive symptoms observed in depression. Mental control theory can also help

explain what happens to depressive cognitions when depression remits, and possibly how depression vulnerability develops in the first place.

Cognitive Theories of Depression

  Depressive thought patterns. One of the key assumptions of the cognitive theory of depression is that a negative (maladaptive) self-schema is active when an individual is depressed, and that the schema causes biased processing of information, which is evident in the depressive thought content (Hollon & Beck, 1979; Beck et al, 1979). Segal (1988) defines this type of schema as an "organized self-structure of interrelated negative constructs" (p. 150). When a person is depressed, this pattern of negative beliefs is active, and her thinking is dominated by negative thoughts (Beck et al., 1979). That is because the schema directs cognitive processes involved in the allocation of attention and the encoding of information into memory; the later retrieval of information from memory; and inferences made from and about experiences (Winfrey & Goldfried, 1986; see also, Rumelhart, 1984; Freeman & Reinecke, 1995; Segal & Ingram, 1994). Thus, the schema specifically facilitates the processing of information in a negative self-referential manner.

  Information-processing biases. Ingram (1984b) stated that such information-processing biases may be used to explain the types of cognitions and symptoms proposed by cognitive theories of depression. Research in the area of social cognition has supported conclusions that schemata produce information-processing biases and the resultant depressive symptoms proposed by cognitive theories. In general, depression and depressive attitudes are linked to more negative perceptions of the self and one's experiences, as well as the later recurrence of depressive symptoms (e.g., Segal, Gemar, & Williams, 1999; Rude, Valdez, Odom, & Ebrahimi, 2003; also, for a review see Sacco

& Beck, 1995). In a review of other studies on depression, Haaga, Dyck, and Ernst (1991) reported that depressed individuals exhibit negatively biased and more self-focused allocation of attention; they more easily recall and recognize negatively-toned information and words; and, they make more extreme negative inferences about the projected outcomes of negative events.

Diathesis-stress model of depression. Negative self-schemata develop over the course of childhood, when maladaptive beliefs about the self in relation to others, the environment, and the future form and strengthen (Freeman & Reinecke, 1995; Young, 1994; Sacco & Beck, 1995). In Beck's (1976) model of depression, latent negative self-schemata, or dysfunctional beliefs, act as a diathesis for depression (Beck et al., 1979; Abramson, Alloy, & Metalsky, 1988), which is defined as a hypothetical maladaptive cognitive structure that is assigned a causal or contributory status in the development of depression (Segal & Ingram, 1994). Depression-prone individuals are proposed to possess a vulnerability, or diathesis, which when activated by a relevant stressor triggers the downward spiral into depression (e.g., Beck, et al., 1979; Abramson, et al., 1988; Segal & Ingram, 1994). The stressor is often defined as a stressful or negative life event, or accumulation of many minor stressors, involving experiences that are relevant to the content of the diathesis. Because these stressful experiences are relevant to the diathesis, they serve to cue its activation (Beck et al., 1979; Ingram, 1984b). Schemata remain inactive over a period of time until they are activated when an individual is presented with a schema-relevant "circumstance" that is generally a situation involving themes of loss, rejection, or failure, to which the individual has been sensitized through past experiences (Sacco & Beck, 1995; Beck et al., 1979).

Evaluating diathesis-stress predictions. Although negative depressive schemata become latent after depression remits, they should be accessible, able to influence information processing, and be ready to react to relevant stressors. Such information processing biases have been identified in depression-vulnerable individuals who have a history of depression or have reported recent depressive symptoms. Some studies have shown greater recall for negative self-descriptive adjectives by depression-vulnerable individuals than by nonvulnerable individuals when in a dysphoric mood (Teasdale & Dent, 1987; Gilboa & Gotlib, 1997; for a review, see Segal & Ingram, 1994), and negatively biased processing of information during heightened self-focus (Hedlund & Rude, 1995; Rude, Covich, Jarrold, Hedlund, & Zentner, 2001). Other studies have demonstrated that negative mood induction can facilitate measuring dysfunctional attitudes (e.g., Miranda, Gross, Persons, & Hahn, 1998). Lastly, the diathesis-stress hypothesis was supported by Miranda (1992), who found that formerly depressed, but currently asymptomatic individuals reported higher dysfunctional thinking following stressful life events.

Suppression and Depression Vulnerability

Wenzlaff and Bates (1998) suggested that the apparent latency of the depressive schema following depression remission may be more a result of the active suppression of negative thought content than the result of dormant depressive thinking. To test this hypothesis, the investigators asked depressed, formerly depressed, and nondepressed college students to complete three sets of the Scrambled Sentence Task. All participants received counterbalanced instructions to form positive statements, negative statements, and whatever statements came to mind. Additionally, half of the participants received

cognitive load instructions to maintain a six-digit number in memory during each of the tasks. The results showed that formerly depressed participants formed as few negative sentences and as many positive sentences as nondepressed participants when there was no concurrent cognitive load. However, when cognitive resources were depleted, formerly depressed participants who were attempting to form positive statements performed similarly to the depressed participants, forming a higher percentage of negative statements than nondepressed participants.

Suppression contributes to vulnerability. From the results of the study, Wenzlaff and Bates (1998) concluded two things - first, that suppression conceals a cognitive vulnerability to depression, and second, that mental stress can inhibit suppression efforts and reveal that vulnerability. As additional support for these conclusions, the investigators found that formerly depressed participants who identified as frequent suppressers formed more negative statements than did those who had reported infrequent use of suppression, and also formed more negative statements than any other group when under cognitive load. The results also revealed that the process of suppression itself is what contributed to the enhanced intrusions of negative thoughts on the task, not the level of previous depressive symptoms. Altogether, these findings suggest that not only does suppression mask cognitive vulnerability, but that it contributes to that vulnerability by promoting more negative thinking than would have otherwise occurred had suppression not been attempted. This conclusion is consistent with the concept of a monitoring process and deep cognitive activation contributing to intrusive thinking, particularly when mental control efforts are hindered.

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Suppression and predicting depression. As further support of the assertion that suppression contributes to depression vulnerability, more recent research has focused on attempting to predict depressive symptoms from the interaction of suppression and negative cognitive processes. Rude, Wenzlaff, Gibbs, Vane, and Whitney (2002) found that participants who had identified as high suppressors produced more negative solutions to the Scrambled Sentences Task than low suppressors, and that the combination of suppression tendency with the revealed negative thinking on the task was predictive of depressive symptoms four to six weeks later. Rude, Valdez, Odom, and Ebrahimi (2003) extended this study using a subset of the original participants, and demonstrated that the exposure of negative thought processes during cognitive load was predictive of Major Depression Disorder diagnoses 18 to 28 months later. Taken together, these results suggest that the use of suppression to control negative thinking could be an important risk factor for depression, particularly amongst those with preexisting negative thought processes (i.e., depressive self-schema).

Suppression and Depression

Research has already established that suppression plays a significant role in the masking of depression vulnerability and may actually be an important component of the vulnerability itself. Besides contributing to vulnerability, suppression may also help trigger, maintain, and exacerbate depressive symptoms in those who are at-risk or currently depressed.

Suppression and depression onset. Based upon years of research on suppression and depressive thought processes, it appears that the interaction of suppression-related processes, the depressive schema, and stressful life events may be what leads to the onset

of depressive symptoms (for reviews, see Sacco & Beck, 1995; Wenzlaff & Wegner, 2000; Wenzlaff, 2005). Whereas cognitive accounts of depression state that negative events, because of their similarity to depressive schema contents, trigger depressive cognitions, mental control theory provides further clarification that the automatic monitoring for indicators of suppression failure creates a heightened alertness to schema-relevant events. Thus, the negative event may cue schematic thinking, and thoughts about the event itself may also become targets for renewed suppression attempts. Additionally, the stressful nature of the event may further help to reveal previously hidden negative schematic thinking and hinder efforts to control those thoughts. The interaction of stress and negative mood from the event, plus the intrusive negative thoughts from depressive memories, serve to create a self-perpetuating cycle involving multiple sources of cues for intrusive thoughts and repeated attempts to suppress the resulting thoughts and emotions. When you add depressed mood, which has also been found to deplete mental resources and interfere with effortful cognitive processes (Hartlage, Alloy, Vasquez, & Dykman, 1993), you have a recipe for depression.

Suppression and depression maintenance. The maintenance and exacerbation of the now evolving depressive symptoms occur because of someone's repeated attempts to control their negative thoughts and emotions. Researchers have found that depressed individuals report attempting suppression to control negative thinking, and that higher suppression ratings are related to higher ratings of depression symptoms (Wenzlaff & Bates, 1998). Depressed individuals have demonstrated trouble inhibiting their negative thinking, with a tendency toward more negative intrusions and fewer positive thoughts than nondepressed individuals (Wenzlaff & Bates, 1998; Conway, Howell, &

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Giannopolous, 1991). Wenzlaff, Wegner, and Roper (1988) suggested that the intrusiveness of thoughts may be due to depressed individuals' tendency to choose more negative distracters to cope with unwanted thoughts, even when provided with positive distracter options, and even though they acknowledge that positive thoughts would be more effective distracters. The intrusiveness of the unwanted thoughts may then be cued by the affectively related distracters, consistent with the concept of mood-thought associations that are intensified by suppression (Wenzlaff et al, 1991). Unfortunately, during depression, negative distracters are more available than positive distracters because of the currently active depressive schema (Wenzlaff, 1993).

   Intrusive thoughts and depression. As an added sting, the intrusive nature of thoughts experienced when suppression fails can be distressing. Kelly and Kahn (1994) found that people suppressing unpleasant intrusive thoughts or even neutral thoughts expressed more feelings of distress and loss of control associated with the intrusions. Wenzlaff and Wegner (2000) suggested that the distress and self-criticism that occurs during suppression failure is due to the role of metacognition in mental control efforts. Basically, the stronger someone believes that suppression should succeed, the more likely they will experience distress when their efforts are unsuccessful. Such conclusions that suppression leads to negative self-evaluative processes are consistent with other findings that suppression leads to reduced self-esteem (Borton, 2002; Borton et al., 2005), and with hypotheses about the roles of perceived lack of control in the development of learned helplessness (Abramson, Seligman, & Teasdale, 1978; Abramson, Metalsky, & Alloy, 1989).

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Suppression and the Development of Depression Vulnerability

Much has already been said about the role that suppression plays in the maintenance of depression and depression vulnerability when someone has a history of depressive thinking. However, little attention has been given in the literature to the role suppression might play in the creation of the strong associative network of negative self-referential beliefs that could develop into a cognitive vulnerability to depression.

Early depressive schema development. Although a vulnerability to depression is proposed to develop out of childhood experiences "that shape the development of cognitive schemas in a negative, self-referential manner" (Sacco & Beck, 1995, p.330), cognitive theory has not specifically addressed how the accumulation of early negative experiences are transformed into the depressive schema. Beevers (2005) has suggested that vulnerability to depression results primarily from repeated exposure to experiences that suggest that someone is unworthy or defective. Multiple exposures to the same negative, self-referential themes are proposed to lead to automatic and negatively-biased processing of incidents similar to those themes, much like how a depressive schema is supposed to perform. Beevers reviewed a number of studies demonstrating such a link between childhood maltreatment, negative self-referential biases, and depression vulnerability.

Early childhood events and avoidant coping. It may be more a factor of the need to hide the maltreatment, and in that sense suppress reactions to it, that creates the strength of associations between the early experiences and negative beliefs about oneself in relation to the world and others. Wenzlaff and Eisenberg (1998) have suggested that parenting styles that inhibit the expression of negative emotions, either through the use of

negative consequences or dismissal, encourage the development of avoidant coping

strategies in children. Furthermore, such avoidant coping strategies appear to be

associated with poor social and emotional skills, and may present a risk factor for

negative intrusive thoughts and depressive emotions when stress derails habitual avoidant

coping attempts. Thus, the observed relationship between depression vulnerability and

early emotionally abusive or neglectful experiences, may be as much a result of the

coping strategies these experiences encourage as it is of the experiences themselves.

Suppression and preoccupations. Most of the evidence that suppression can lead

to increased accessibility of unwanted thoughts and stronger associations with affect and

environmental cues has been obtained using neutral or self-irrelevant cues, which leaves

much uncertainty about whether suppression of negative self-referential thoughts could

pose a risk for depression vulnerability. However, some evidence that suppression of

unwanted self-relevant thoughts can lead to the development of intrusive thoughts, such

that someone who has never had preoccupations with a given issue may become plagued

with recurrent thoughts about it, comes from a study by Harnden, McNally, & Jimerson

(1997), who suggested that suppression may play a greater role in the formation of

weight preoccupations than in their maintenance. Dieters and nondieters were first

instructed to either suppress or express thoughts about weighing themselves while

reporting upon their stream of consciousness, then later express thoughts about weighing

themselves while reporting their thoughts for a second time. Although dieters

demonstrated the greatest difficulty controlling weight-related thoughts during

suppression, only the nondieters experienced a post-suppression rebound of such

thoughts. Thus, only individuals with no history of weight concerns demonstrated

intrusive preoccupations following suppression. Unfortunately, no studies have demonstrated a similar development of depression-related preoccupations following suppression.

<p align="center">*Methodological Issues in the Research on Mental Control*</p>

Wenzlaff and Wegner (2000) reviewed advances in the study of thought suppression since the original white bear studies conducted nearly fifteen years ago. In their review, they described several key variables that may affect the observation of thought suppression effects in studies of mental control. Below is a review several of the variables that have particular relevance to the design of the present study. They include the emotional valence and source of the mental control target thoughts and the method used to assess the effects of mental control.

Target Characteristics

Emotional valence of the target thoughts. Many studies of thought suppression have provided either neutral stimuli (e.g., white bear) or positive and negative emotionally valenced stimuli as targets for mental control. Research using neutral stimuli has generally been successful at producing predicted effects of thought suppression. These results include increased target intrusions during cognitive load (e.g., Wegner & Erber, 1992; Clark, Winton, & Thynn, 1993), cognitive rebound following suppression (e.g., Wegner et al., 1987; Clark, Ball, & Pape, 1991; Lavy & van den Hout, 1994), and emotional rebound in the form of increased emotional distress following suppression (e.g., Kelly & Kahn, 1994).

The results of studies using emotional targets have generally been mixed. Wegner and Smart (1997) reported that it is harder to suppress emotional material than neutral

targets. As an example, Petrie, Booth, and Pennebaker (1998) found that participants had

greater difficulty suppressing personally-relevant emotional topics than neutral ones.

However, despite the apparent challenges of suppressing emotional material, Roemer and

Borkovec (1994) suggested that studying the suppression of such material may provide

information that is "theoretically interesting and more clinically relevant" than the

suppression of neutral targets (p.467). As an example, Davies and Clark (1998), in a

study of the relationship between suppression and post-traumatic thought intrusions,

compared think-aloud reports of participants who had either viewed a distressing film or

a film about polar bears. They found rebound of film-related thoughts only for those who

had viewed the distressing film. Additionally, Petrie and colleagues (1998) were able to

find that, in contrast to suppressing negative emotional topics, those who had expressed

thoughts about those topics reported greater happiness eight weeks after the study. Thus,

these studies provide some support for the value of using emotional stimuli.

Other studies have provided less equivocal evidence for the use of emotional

material. Harnden, McNally, and Jimeson (1997), in their study comparing the effects of

mental control for dieters and nondieters, obtained no cognitive rebound of weight-

related thoughts for dieters. They suggested that the weight-related thoughts may have

represented current emotional material for the dieters, and therefore may have already

been so frequently accessed that suppression could not increase its effect any more. A

final example of a study using emotional stimuli also did not demonstrate cognitive

rebound, but did provide other theoretically interesting results. Roemer and Borkovec

(1994) had subjects express or suppress thoughts about self-generated memories of

anxious, depressing, or neutral situations on a think-aloud task, followed by expression of

their situation-related thoughts in a second thought report. Besides measuring intrusions of target thoughts, they also assessed self-reported emotional responses to the personal situations. Although they did not observe cognitive rebound after suppression, in general they did find that suppression resulted in significantly increased levels of reported anxiety and marginally significant increases of depressive affect. It appears, then, that one benefit of using emotional material as targets of mental control studies may be the opportunity to observe the emotional impact of suppression.

Source of the target thoughts. Past research has employed either experimenter-supplied stimuli as targets for mental control or natural participant-generated suppression targets. Research using experimenter-provided targets, such as white bears (e.g., Wegner et al., 1987; Kelly & Kahn, 1994), taped stories (e.g., Clark, Winton, & Thynn, 1993), or neutral and distressing film content (e.g., Davies & Clark, 1998; Harvey & Bryant, 1998) have produced generally consistent results supporting predicted effects of suppression. Findings for natural suppression targets, such as personal intrusive thoughts, have been less consistent. As was previously discussed, Edwards and Dickerson (1987) reported that intrusive thoughts are harder to dismiss and replace than neutral thoughts, possibly because of the emotional distress and physiological arousal associated with those thoughts. Because they are more likely to cause distress, it would be expected that personal intrusive thoughts would be prime targets for suppression, and therefore likely to produce the paradoxical consequences of thought suppression, like the emotional consequences of suppression of distressing self-generated situations reported in Roemer and Borkovec (1994). Most studies, however, have failed to find any cognitive effects of suppressing personal intrusive thoughts (e.g., Roemer & Borkovec, 1994; Kelly & Kahn,

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1994; Borton, 2002; Borton et al., 2005). Only McNally and Ricciardi (1996) were able to obtain some evidence of rebound following suppression of a personally-relevant negative thought. They reported that suppressers of the self-generated thoughts experienced them three times more frequently following suppression. However, the frequency of thoughts did not significantly differ from those who had suppressed neutral thoughts or who had expressed their thoughts. Therefore, no studies to date have been able to demonstrate cognitive rebound following suppression of personally-relevant thoughts.

Kelly and Kahn (1994) have suggested that the use of personally-relevant thoughts should actually decrease the expected effects of thought suppression. The authors stated that personal intrusive thoughts and experimenter-provided thoughts differ on the extent of prior experience trying to control them. They proposed that people could become proficient at suppressing their own intrusive thoughts and may have access to a large network of well-practiced distracters to aid in suppression. This proposal was tested in two experiments by having subjects either suppress or express their own intrusive thoughts (Exp.1 & 2) or neutral thoughts of a white bear (Exp. 2). They found no rebound after suppression of personal thoughts, but did observe cognitive rebound after suppression of the neutral thought. However, they did find that subjects suppressing intrusive thoughts, especially if they were unpleasant thoughts, experienced more distress after suppression than did those suppressing neutral thoughts. This finding is consistent with Wegner and Gold's (1995) finding that subjects suppressing emotionally-charged memories of a "hot flame" did not experience cognitive rebound, but did exhibit psychophysiological emotional arousal after suppression.

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Expanding upon Ingram's (1984a) discussion of depth of processing, it would be expected that the suppression of personally relevant information should result in predictable thought intrusions and associated affect. That is because personally relevant information is deeply processed and increases access to a broader network of interrelated thoughts and emotions. However, this effect has only been obtained when the relevant schema has been primed via mood manipulation (e.g., positive or negative mood) and the personal information to be processed is congruent with the primed mood. For example, Howell and Conway (1992, Exp.1), in a study of the mediating effects of mood on the suppression of personal unwanted thoughts, had participants suppress thoughts of either positive or negative life events after being musically induced into a positive or negative mood-state. The investigators observed mood-congruent effects for thought intrusions, in that thought intrusions tended to be similar in valence to participants' mood-states. When feedback valance matched mood-state, they also found mood-congruent effects for thoughts expressed preceding intrusions about the feedback. Similar mood-congruent effects for intrusions were found in a second experiment for currently dysphoric (negative mood) and nondysphoric (positive mood) subjects suppressing life event thoughts and, in Conway, Howell, and Giannopoulos (1991), for dysphoric and nondysphoric subjects suppressing thoughts about positive or negative performance feedback. These findings suggest that mood priming prior to the suppression of mood-congruent personally-relevant thoughts may intensify the counterintentional effects of thought suppression, such that trying to avoid negative thoughts, for example, will increase the number of negatively-valenced intrusive thoughts.

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Method of Assessment

Two commonly used methods of measuring the effects of thought suppression include self-report measures of thought content and information-processing measures (Wenzlaff & Wegner, 2000). Many of the mental control studies discussed in this review have used some form of thought reporting (e.g., Wegner et al, 1987; Howell & Conway, 1992; Kelly & Kahn, 1994; Wegner & Gold, 1995; Harvey & Bryant, 1998; Petrie, Booth, & Pennebaker, 1998). A commonly used self-report measure involves the verbal reporting of the stream-of-consciousness (Pope, 1978), in which individuals report their moment-to-moment mental experiences. These reports have the advantage of allowing both thematic and sequential analysis of thought content (Klinger, 1978). However, they also offer some disadvantages, such as the limitation that thought reporting is an unnatural situation, subjects can only express a fraction of their mental contents, and like most self-report measures, they may be vulnerable to biased reporting (Klinger, 1978; Wenzlaff & Wegner, 2000). An additional problem involves how occurrences of target thoughts are noted in these reports. Some methods of recording target thoughts, such as having participants ring a bell each time the target thought occurs, may unnaturally cue the thought and inflate its occurrence in thoughts (see, Wenzlaff & Wegner, 2000). There is also the problem of identifying what constitutes an instance of the thought in the reports, particularly when the target is not a specific, concrete item (e.g., "white bear").

Information-processing measures, such as the Scrambled Sentences Task (Wenzlaff and Bates, 1998) offer the advantage of measuring thought processes that are automatic and relatively less subject to conscious control; however, they may also have some limitations concerning the unnatural measurement situation. For instance, the

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Scrambled Sentences Task limits responses to a dichotomy of negative or positive solutions, thereby disregarding a wide array of other types of thought content. Information-processing measures of mental control have generally proven effective at demonstrating processing biases associated with suppression, as well as the ironic effects of suppression under cognitive load and in rebound (e.g., Wegner, Erber, & Zanakos, 1993; Lavy & van den Hout, 1994; Macrae et al., 1997; Wenzlaff & Bates, 1998, 2000). However, such measures may not be as useful for evaluating naturally occurring thought content.

One study that illustrated the problems of using an information-processing task to evaluate thought content was a pilot study conducted by Bates and Leal (2001). The investigators provided 76 college undergraduates both negative feedback about their social competence and positive feedback about their analytical abilities on a test purported to be a projective measure of these constructs. Following the feedback, participants were instructed to verbally report their thoughts and were provided directions to either avoid thinking about the negative feedback (suppression), to focus on the positive feedback (concentration), or to report whatever thoughts came to mind first ("free-monitoring" control). Lastly, they completed a modified version of the Scrambled Sentence Task containing 30 scrambled sentences divided between 11 interpersonally-oriented sentences, 11 autonomy-related sentences, and 8 general self-statements. Analyses performed to assess cognitive rebound on the Scrambled Sentence Task found no differences between the instruction groups.

Some methodological weaknesses may account for the lack of differences between instruction groups in this study. For one, this study did not employ a practice

think-aloud procedure prior to the experimental one; therefore, participants may not have become sufficiently familiarized with the task to adequately complete the task as instructed (Carter, Wegner, & Schneider, 1987; cf. Wegner et al., 1987). More importantly, the use of the Scrambled Sentence Task as an information-processing measure for rebound of negative interpersonal thoughts may have only indirectly measured the types of thoughts that would result from negative social feedback. Thus, using a measure that more directly assesses thought content following suppression might better serve to pick up the specific types of intrusions and the affective valence of thoughts resulting from suppression of negative personal feedback.

Summary

According to the Ironic Processes Theory (Wegner, 1994; Wegner & Wenzlaff, 1996), mental control begins with an intention to change a current mental state, at which time a controlled operating process is initiated to either seek out mental contents that are consistent with the desired change (concentration) or contents inconsistent with the undesired state (suppression). Alternatively, the intent may be to focus on the current undesired state (expression) to facilitate processing of current experiences and achieve a desired mental state. While mental control is being attempted, an automatic monitoring process works in concert with the operating process to signal any occurrences of thoughts that are inconsistent with the desired changes.

Counterintentional consequences of mental control are most likely to occur when someone has been attempting to suppress unwanted thoughts or emotions. That is because the targeted automatic monitor search that runs during suppression subconsciously activates and frequently primes the very mental contents someone may be

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trying to avoid. Research has fairly consistently confirmed these paradoxical effects of thought suppression when mental resources are depleted by cognitive load (e.g., Wenzlaff & Bates, 1998). There is also evidence that suppression causes the rebound of unwanted thoughts following suppression (e.g., Wenzlaff & Bates, 2000), as well as post-suppression emotional rebound and self-reported distress (e.g., Kelly & Kahn, 1994; Wegner & Gold, 1995). These effects have been demonstrated using neutral thought targets, such as a white bear (e.g., Wegner et al., 1987), as well as emotional targets (e.g., Davies & Clark, 1998), on a variety of measures (e.g., Howell & Conway, 1992; Wegner et al., 1993).

Research findings have suggested that mental control efforts may influence the course of depression and pose a risk for future depression. A greater tendency to suppress has been associated with more negative thinking and other depressive symptoms (Wenzlaff & Bates, 1998). Depressed affect has been found to reduce cognitive capacity (Hartlage et al., 1993), which could inhibit efforts to control unwanted negative thoughts and result in more mood-related intrusions (Wenzlaff et al., 1991). Depressed individuals tend to use negative distracters that would also cue further intrusions of unwanted thoughts (Wenzlaff et al., 1988). Lastly, suppression-induced intrusive thoughts are associated with emotional distress and negative self-evaluations (e.g., Kelly & Kahn, 1994), which could intensify depressive affect and contribute to the downward-spiraling cycle of suppression, intrusions, and ever worsening mood.

Studies evaluating the role of suppression in depression vulnerability have demonstrated that suppression contributes to the recurrence of depression and is associated with negative responses to stress. Wenzlaff and Bates (1998) showed that

suppression efforts mask negative thinking patterns in vulnerable individuals, and that these negative thoughts can be revealed during mental stress. Others have found that when controlling for current and previous depression symptoms, chronic suppression can predict future depressive symptoms (Rude et al., 2002). More recently, Wenzlaff and Luxton (2003) found that suppression mediated the relationship between stressful events and depressive symptoms.

Unfortunately, all of the studies that have demonstrated the role of suppression in depression vulnerability have used history of depression symptoms to define vulnerability, or they have been correlational in nature. Thus, they have not been able to rule out the potential confound of preexisting negative thought processes from the relationship between suppression and depression symptoms. For instance, although Wenzlaff and Bates (1998) found a positive relationship between chronic suppression and negative thinking in at-risk individuals, it is possible that negative thinking was responsible for frequent suppression, not vice versa. Overall, then, research has failed to adequately establish that suppression causes negative intrusive thinking, regardless of the presence or lack of a proclivity for negative thinking.

Overview of Study

The present study plans to address this issue of whether mental control strategies exert a causal influence on individuals' thoughts and feelings as they cope with a negative event. Participants in this study received negative feedback on a bogus measure of social competence, and were randomly assigned to one of four mental control conditions. They were then asked to verbally report their thoughts for five minutes while suppressing reactions to the feedback, concentrating on a memory of positive feedback,

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expressing their reactions to the negative feedback, or simply reporting whatever thoughts came to mind. After being released from mental control instructions, all participants were then asked to report whatever thoughts they experienced in a second five-minute think-aloud period. Cognitive and emotional reactions to the feedback were assessed from these stream-of-consciousness reports, as well as from self-report measures. Thus, the design of this study allowed for the direct comparison of three common mental control strategies for coping with reactions to negative personal feedback. Direct comparisons of each of the three strategies were possible both during mental control, and after control had been relinquished.

Methodological Advantages of the Present Study

  Source of target thoughts. A unique feature of the design of the present study is the use of experimentally-induced self-relevant thoughts. The use of self-relevant thoughts, versus other types of neutral or emotional stimuli, should provide more meaningful results for the study of depression vulnerability, since depressive cognitions tend to be negative and self-referential (Purdon, 1999; Wenzlaff, 2005). However, previous studies that have used participant-generated intrusive thoughts have failed to demonstrate that suppression can cause or intensify intrusive thoughts (for reviews, see Wenzlaff & Wegner, 2000; Markowitz & Borton, 2002), possibly because mental control of self-generated thoughts may already be well-practiced (Kelly & Kahn, 1994). Thus, the use of experiment-induced self-relevant thoughts should reduce the impact of practice effects, and additionally limit individual variances in target thought content.

  The design of this study employs bogus negative social competence feedback to encourage negative self-referential thought content that will be the focus of mental

control. The domain of social competence was chosen because it has been identified as a common concern for depressed individuals (e.g., Sacco & Baek, 1995), and social concerns have been found in some studies to be the most frequently identified themes of self-generated intrusive thoughts (e.g., Borton et al., 2005). Thus, the presentation of negative social feedback can be considered analogous to a type of situation that would naturally trigger intrusive thinking and mental control efforts.

Measurement of strategy effects. A final unique feature of this study involves the direct comparison of suppression, concentration, and expression strategies using stream-of-consciousness reporting. No previous studies have allowed evaluation of the relative efficacy of expression and concentration strategies, nor has any previous research allowed direct observation of thought content during concentration. Comparing these strategies with each other and with suppression may provide greater insight into how the processes involved in these forms of mental control differ from suppression and each other. Additionally, because past research on the concentration strategy was limited to information processes (Wenzlaff & Bates, 2000), the use of verbal thought reports in this study allows for further tests of ironic processes hypotheses by providing the opportunity to observe natural thought content.

Research on the relative efficacy of mental control strategies is applicable to aspects of cognitive therapy and other therapies for depression that emphasize the disclosure and processing of negative intrusive thought content, as well as the development of skills for accessing positive distracters (Beevers, Wenzlaff, Hayes, & Scott, 1999). This study should help clarify how suppression contributes to depression vulnerability, thereby aiding the development of therapeutic techniques to combat

suppression's deleterious effects on mental health and well-being. Lastly, it should improve our understanding of how the mental control processes involved in expression and concentration produce positive psychological changes and reduce the occurrence of intrusive thoughts.

<center>*Research Hypotheses*</center>

My study includes predictions for the performance of each of the mental control strategies during mental control efforts and following the relinquishment of mental control efforts. Each hypothesis includes a separate rationale as a review of relevant research and to provide some context for each prediction.

Hypotheses for Performance under Mental Control Instructions

Hypothesis one. **The group of participants instructed to avoid thinking about the test feedback (***suppression***) and the group instructed to think about a memory of favorable feedback (***concentration***) will each spend less time thinking about the test feedback then will either the** *control* **or** *expression* **groups. Participants instructed to think about the test feedback (***expression***) will spend the most time thinking about the test feedback relative to each of the other strategy conditions.** Time spent thinking about the test feedback will be measured as the number of test feedback thoughts recorded in the five-minute stream-of-consciousness report and as the self-ratings of the frequency of test feedback thoughts.

Rationale. This hypothesis is based on a range of research findings concerning the efficacy of suppression and concentration strategies when compared to "free-monitoring" control and "expression" control instructions. Both suppression and concentration instructions have been found effective at controlling intrusive negative thoughts in the

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absence of significant cognitive load (Wenzlaff & Bates, 2000, Exp. 2 & 3). It is also

expected that, as it is the intention of the expression instructions to increase discussion of

the test feedback, the expression instructions in this study should produce an increase in

target thoughts relative to thoughts produced by other instructions, as has been the case in

previous studies (e.g., Wegner, Schneider, Carter, & White, 1987; Harnden, McNally, &

Jimerson, 1997)

Hypothesis two – part A. **The content of thoughts produced by those instructed**

to think about the test feedback (*expression***) will be more negatively valenced than**

thoughts produced by those in each of the other conditions. In contrast, those

instructed to think about a memory of favorable feedback (*concentration***) will**

express fewer negative thoughts than will those in each of the other groups. The

negative valence of thought content will be measured as the number of negative thoughts

produced during the initial stream-of-consciousness report and as coder ratings of the

valence and intensity of affect expressed during the entire report.

Hypothesis two – part B. **The content of thoughts produced by those instructed**

to think about a memory of positive feedback (*concentration***) will be more positively-**

valenced than thoughts produced by those in each of the other conditions. The

positive valence of thought content will be measured as the number of positive statements

produced during the initial stream-of-consciousness report and as coder ratings of the

valence and intensity of affect expressed during the entire report.

Rationale. As previously discussed in the review of literature, individual

propositions, concepts, and related affect are not randomly located in memory, but are

interconnected with other concepts and propositions in various levels of associations

(Segal, 1988; Segal & Ingram, 1994). In particular, thoughts pertaining to the self will demonstrate the strongest associations between concepts and are likely to be associated with a more intense experience of affect, (see, Fiske & Taylor, 1991; Turk & Salovey, 1985), resulting in the greater probability that activating one concept will lead to activation of affectively and cognitively related concepts (Ingram, 1984b; Bower, 1981). Therefore, it is expected that thoughts about negative self-relevant feedback or a memory of positive feedback will activate cognitively and affectively associated thoughts. Lastly, though thought suppression should lead to deep cognitive activation of test feedback thoughts, it is not expected that the amount of conscious negative thoughts will differ from control. This expectation is consistent with results obtained by Wenzlaff and colleagues (1988, Exp.1), which showed that whether nondepressed subjects suppressed or did not suppress thoughts about a negative experience the overall negativity of their reported thought content did not significantly differ.

Hypotheses for Performance following Release from Mental Control Instructions

       Hypothesis three. **Those participants initially instructed to** *suppress* **reactions to the test feedback will experience more test feedback thoughts following release from mental control instructions than will those in each of the other groups. Also, those initially asked either to** *concentrate* **on a memory of favorable feedback or** *express* **thoughts about the test feedback will experience fewer thoughts about the test feedback than those in the** *control* **condition during the final think-aloud procedure.** Cognitive rebound during the final think-aloud procedure will be measured as the number of test feedback thoughts recorded in the five-minute stream-of-consciousness report and as the self-ratings of the frequency of test feedback thoughts.

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Rationale. There is a large body of research supporting the ironic rebound of unwanted thoughts after thought suppression is halted (e.g., Wenzlaff & Bates, 2000; Harvey & Bryant, 1998; Wegner & Gold, 1995). There is a similarly wide variety of research supporting the effectiveness of initial expression at reducing unwanted thoughts after the initial expression period has ended (e.g., Harnden, McNally, & Jimerson, 1997; Wegner & Gold, 1995; Roemer & Borkovec, 1994). Findings concerning the success of concentration strategies in reducing rebound effects are much more limited. Wenzlaff and Bates (2000, Exp. 3) were able to demonstrate that concentration was more effective than both suppression and control instructions at controlling rebound of unwanted thoughts only when participants were asked to control positive thoughts, but it was only more effective than suppression at controlling negative thoughts. However, in related research on the use of distracters during suppression, Wegner and associates (1987) did find that subjects given "focused distraction" instructions to focus on a red Volkswagen while suppressing thoughts about a white bear were less likely to experience rebound of thoughts about the white bear.

Hypothesis four – part A. **The content of thoughts produced by those initially instructed to avoid thoughts about the test feedback (***suppression***) will be more negatively valenced relative to thoughts produced by those in each of the other strategy conditions, whereas those who had initially *expressed* their thoughts or *concentrated* on a memory of positive feedback will report the least negative thoughts, relative to *control*.** The negative valence of thought content will be measured as the number of negative thoughts produced during the five-minute thought reports and as coder ratings of the valence and intensity of affect expressed during the entire report.

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Hypothesis four – part B. **The content of thoughts produced by those initially instructed to avoid thoughts about the test feedback (***suppression***) will be less positively-valenced relative to thoughts produced by those in each of the other strategy conditions, whereas those who had initially *expressed* their thoughts or *concentrated* on a memory of positive feedback will report the most positive thoughts, relative to *control*.** The positive valence of thought content will be measured as the number of positive thoughts produced during the five-minute thought reports and as coder ratings of the valence and intensity of affect expressed during the entire report.

Rationale. Expanding upon the rationales to hypotheses two and three, suppressed thoughts should demonstrate higher levels of accessibility during "free-monitoring" relative to the other conditions, as evident in the rebound of test-related thoughts after suppression has been halted (see Macrae, Bodenhausen, Milne, & Jetten; and also Wegner & Gold, 1995). This increased accessibility and activation of test-related thoughts should increase the likelihood of the activation of similarly valenced thoughts at the same time. Of particular note, despite activation of test-related thought content during initial expression, the expected reduction in test-related thoughts after expression should be accompanied by a reduction in similarly valenced thoughts because expression does not involve a contextual distracter search.

Hypothesis for Self-Reported Affect

Hypothesis five – part A. **Those initially instructed to avoid thinking about the test feedback (***suppression***) will report lower positive affect and greater negative affect following completion of the final think-aloud procedure than will those who initially received each of the other strategy manipulations.** Positive affect will be

measured by scores on Positive Affect and Negative Affect Schedule-Positive Affect scale (PANAS-PA), and negative affect will be measured by scores on the PANAS-Negative Affect (NA) scale (Watson, Clark, & Tellegen, 1988).

Hypothesis five – part B. **Those initially instructed either to think about a memory of favorable feedback (*concentration*) or to think about the test feedback (*expression*) will report higher positive affect and lower negative affect following completion of the final think-aloud procedure than will those who initially received** *control* **instructions.** Affect will be measured as above.

Rationale. Various studies have demonstrated the negative impact of suppression on emotional experiences following cessation of mental control efforts using physiological measures (e.g., Wegner & Gold, 1995), and a variety of self-report measures (e.g., Kelly & Kahn, 1994; Borton, 2002). Other research has demonstrated improvements in post-expression emotional well-being (e.g., Roemer & Borkovec, 1994; Petrie, Booth, & Pennebaker, 1998). Because of limited research on the use of concentration strategies to cope with negative experiences, the prediction that focusing on a positive memory will have beneficial effects on post-concentration affect is based upon the anticipated activation of positive affect by thoughts about the memory (Ingram, 1984b; Bower, 1981), and expectations that a positive approach strategy will avoid the paradoxical effects of suppression.

Chapter III: Methodology

In the present study, undergraduate college students met in large groups to complete measures of depression, thought suppression, and a bogus test of social competence. In later individual sessions, they were provided negative feedback on the bogus social competence test, which served to simulate a negative social experience. In an initial experimental thought report, students were instructed to apply one of four mental control strategies: They were asked either to suppress or express thoughts and emotions about the negative feedback they received from the test, concentrate on a memory of positive feedback, or they received "free monitoring" control directions to think about anything (see Table 1). For a second thought report period all participants received control instructions to report whatever came to mind. Prior to the thought report procedures and immediately afterwards they completed a measure of current positive and negative affect.

Participants

Undergraduate students (66 females and 24 males) were assigned to this study through their participation in the Educational Psychology subject pool. Participants received two hours of research participation credit for completion of the group and individual experiment sessions.

Depression screening. Participants were screened for depressive symptoms as measured by the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) during both the group and individual administrations. Students selected for the study obtained scores falling within the ranges for nondepressed (0 to 9) and mildly dysphoric (10 to 15), whereas students who obtained scores of 16 and above (dysphoric or

depressed) on the BDI during either administration were not retained for the study. Those screened out prior to the individual session were given the opportunity to complete their class credit through a concurrently running alternate study. Although no participants obtained a score of 16 or above on the BDI during the individual administration, it was planned that they would have been debriefed and released from the study with full credit.

The decision to exclude depressed individuals from the study was the result of a twofold desire to protect currently depressed individuals from the potentially harmful effects of processing negative feedback and to avoid the possible confound that depression symptoms would present when interpreting the results obtained following mental control manipulations. Additionally, the choice to include both nondepressed and mildly dysphoric participants in this study was based upon BDI cut-off scores recommended by Kendall, Hollon, Beck, Hammen, and Ingram (1987) for usage of the BDI with college student samples. Based on lower mean scores in college samples than in outpatient samples, they suggest labeling students scoring from 10 to 15 on the BDI as depressed only when additional assessments (e.g., structured clinical interview) corroborate a diagnosis of depression. Therefore, in the absence of such corroborating evidence, participants obtaining scores of 15 and below on the BDI were considered clinically nondepressed.

English-proficiency screening. Participants were also screened during the group session for English language fluency. They were asked if they speak English as their primary or first language. For those who stated that English is not their primary language, they were asked to describe their level of fluency with the following options: (1) *I find it very difficult to communicate in English*, (2) *I find it sometimes difficult to communicate*

in English, (3) *I communicate very comfortably in English, but not as fluently as in my primary language*, (4) *I communicate at least as fluently in English as I do in my primary language*. Because of the highly verbal nature of stream-of-consciousness reporting in this study, limitations in access to multilingual scorers for the thought reports, and the necessity to ensure consistency of scoring, it was important to restrict participation to those who could comfortably and quickly access and express their thoughts in English. Therefore, participation in the study was limited to those who speak English as their primary language, who scored a (3) or (4) on the fluency questions, or who were able to demonstrate sufficient English fluency as assessed by the experimenter during the individual session. Those who did not meet fluency requirements were identified at the time of the individual session and were debriefed and released from the study with full credit.

Measures

   Demographic information. Participants were asked to provide their age, sex, and ethnicity in their experiment packets at the start of the study, in addition to completing the questions about English fluency (Appendix B).

   Depression. The Beck Depression Inventory (BDI; Beck et al., 1979) is a 21-item self-report inventory designed to assess the severity of depressive symptoms in adolescent and adult populations. Symptoms are rated on a 4-point scale indicating a range of severity from absent to severe. The BDI has demonstrated psychometric utility with both psychiatric and nonpsychiatric populations (Kendall, Hollon, Beck, Hammen, & Ingram, 1987; Beck, Steer, & Garbin, 1988). In a review of studies concentrating on the psychometric properties of the BDI, Beck and associates (1988) reported that, for use

in nonpsychiatric populations, the BDI has high internal consistency (average coefficient alpha = .81) and concurrent validity (clinical ratings: average Pearson product-moment correlation = .60; MMPI-D: average Pearson product-moment correlation = .60). Pearson product-moment correlations for stability range from .60 to .83 for test periods ranging from one hour to four months. It has strong construct validity, in that the BDI measures many of the proposed relationships between symptoms (e.g., cognitive, affective, and somatic) considered indicative of depression.

Chronic thought suppression. The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994; see Appendix C) is a 15-item self-report measure of chronic thought suppression. Individual items (e.g., I have thoughts that I cannot stop) are rated on a five-point scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Thought suppression, as measured on the WBSI, is described as a stable trait, which is reflected in correlations between administrations ranging from .69 (3 weeks to 3 months) to .92 (1 week). Scores on the WBSI have been found to significantly correlate with depressive responding on the BDI (*r*'s = .44 to .52) in college samples, supporting a predicted relationship between depression and a tendency for thought suppression (see also Wenzlaff, 1993).

Social competence test (SCT). The task that was presented to participants as a test of social competence actually consisted of two combined measures. The first measure was the Texas Social Behavior Inventory (TSBI; Helmreich, Stapp, & Ervin, 1974; Helmreich & Stapp, 1974; see Appendix D), a 32-item self-report measure of self-esteem and self-perceived social competence. Each item (e.g., *It is hard for me to start a conversation with strangers*) has five response options, with descriptions ranging from

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"*not at all characteristic of me*" to "*very characteristic of me.*" Items are scored on a scale from 0 (lower self-esteem) to 4 (highest self-esteem).

The TSBI items used in this study were actually a combination of the two TSBI short forms A and B (Helmreich & Stapp, 1974), which are more widely available and used in research than the original long form. Combined, the short forms yield the original 32 items from the long form; however, the order of items is not identical.

The second measure was a modified version of the Dating and Assertion Questionnaire (DAQ; Levenson & Gottman, 1978; see Appendix E), which was described as a measure of social competence in specific situations related to dating relationships and assertive behaviors, as well as the amount of discomfort and expected level of incompetence in such situations. The DAQ consists of two parts: The first part measures the likelihood of someone performing certain assertive and dating-related behaviors. It consists of 9 items to which responses range from 1 (*I never do this*) to 4 (*I do this almost always*). The second part consists of 9 short social scenarios for which participants describe their expected level of comfort and ability to handle the situation described. Response options are scored on a 5-point scale and range from "*I would be so uncomfortable and so unable to handle this situation that I would avoid it if possible*" to "*I would feel very comfortable and be able to handle this situation very well.*"

For use in this study, the original DAQ was modified in several ways to remove heterosexually-biased language. For instance, references to a "member of the opposite sex" were changed to "an attractive person," "someone to whom you are attracted," or "someone attractive" where appropriate to maintain as closely as possible the original sentence structures and meanings of the excerpts.

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Participants were presented with the TSBI, followed by the DAQ, and were told that it was one measure of social competence and social self-esteem called the Social Competence Test (SCT).

Importance of social competence to self-concept. Participants completed two questions meant to serve as indices of social competence self-schemata (Dykman, Horowitz, Abramson, & Usher, 1995). Individually, these items measure self-perception of social competence and perceived importance of social competence. They served as potential covariates for interpreting individual reactions to the Social Competence Test feedback. The first item was intended as a self-rating of social self-esteem. Participants answered the question*, "In general, how socially competent do you view yourself as being?"* with response options: *very socially incompetent* (1*), somewhat socially incompetent* (2), *equally socially competent and incompetent* (3), *somewhat socially competent* (4), and *very socially competent* (5). The second item was designed to determine how schematic participants were for social competence. For this item, participants answered the question, "*How important is the characteristic of social competence to your view of yourself?*" to which responses range from 1 (*not at all important*) to 5 (*very important*). Dykman and associates (1995), whose item response options were scored in reverse order from those in the present study, reported a correlation of -.70 between self-ratings of social competence and scores on the TSBI, suggesting that self-ratings are an adequate means for assessing social competence self-schemata.

SCT feedback perception and manipulation checks. In order to determine the effectiveness of the bogus SCT feedback for providing a negative social experience,

participants responded to the following two items after they received their feedback: "*In general, how socially competent does the test describe you as being?*" and "*How favorable do you feel the feedback was for you?*" (Conway, Howell, & Giannopoulos, 1991). Response options to the first item range on a 5-point scale from 1 (*very socially incompetent*) to 5 (*very socially competent*), and to the second item they range on a 7-point scale from 1 (*not at all favorable*) to 7 (*very much favorable*).

To determine the impact of the mental control manipulations on the participants' perceptions of the Social Competence Test feedback, participants responded a second time to the two manipulation check questions concerning their perceptions of the feedback at the end of the experiment. They were additionally asked, "*How accurately do you believe the feedback from the Social Competence Test described you?*" This item was rated on a 7-point scale ranging from 1 (*not at all accurately*) to 7 (*very much accurately*).

Self-reported positive and negative affect. Current affect was measured on the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988; see Appendix F). The PANAS consists of two 10-item mood scales that assess the fairly independent dimensions of positive affect (PA) and negative affect (NA). The authors define these dimensions as follows:

> Briefly, Positive Affect (PA) reflects the extent to which a person feels enthusiastic, active, and alert. High PA is a state of high energy, full concentration, and pleasurable engagement, whereas low PA is characterized by sadness and lethargy. In contrast, Negative Affect (NA) is a general dimension of subjective distress and unpleasurable engagement that subsumes a variety of

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aversive mood states, including anger, contempt, disgust, guilt, fear, and

nervousness, with low NA being a state of calmness and serenity. (p. 1063)

The PANAS instructions can be modified to allow for measurements ranging

from moment-to-moment changes in affect to descriptions of what someone has felt over

the past year or feels on average. Test-retest reliabilities reported for this measure range

from .47 to .68 for PANAS PA and .39 to .71 for PANAS NA, with test-retest reliabilities

for moment-to-moment experiences of affect at .54 (PA) and .45 (NA). For the purpose

of this study, participants were asked to indicate the extent to which they were

experiencing the listed feelings at the present moment. Ratings of how much someone

was experiencing each listed feeling could range from 1 (*very slightly or not at all*) to 5

(*extremely*).

Self-reported thought content. Thought content was measured using self-reported

time spent thinking about the Social Competence Test feedback and verbal stream-of-

consciousness reports. Following each of the experimental think-aloud periods,

participants answered the question, "*How much time did you spend thinking about the*

feedback you received today on the social competence test?" This question was a

modification of a similar measure used by Clark, Ball, and Pape (1991), and used the

same 5-point rating scale with the following response options: (1) *none of the time*, (2)

some of the time, (3) *half of the time*, (4) *most of the time*, and (5) *all of the time*.

Responses to this question served as a self-report measure of target-specific thought

content during mental control and as an additional measure of cognitive rebound on the

second think-aloud task.

Stream-of-consciousness thought content. Thought content was additionally

measured using verbal thought reports. During this stream-of-consciousness reporting,

participants were asked to verbally report the contents of their thoughts (i.e., think aloud)

for 5 minutes. The purpose of the thought reports was to allow for observation of a wide

range of possible thoughts and of the sequence of those thoughts (Klinger, 1978). The

general instructions for the task were adapted from those used by Pope (1978) and have

been used extensively on think-aloud measures for reporting stream-of-consciousness

(e.g., Wegner et al., 1987; Conway, et al., 1991; Wegner & Gold, 1995). Participants

were all initially provided the following instructions for completion of a practice thought

report:

> Please, try to verbalize the thoughts you are experiencing while you experience
> them. "Your report might include (but is not limited to) descriptions of: images,
> ideas, memories, feelings, fantasies, plans, sensations, observations, daydreams,
> objects which catch your attention, or efforts to solve a problem. There are no
> restrictions, conventions, or expectations: simply report on whatever is going
> through your mind at the moment (whatever you are conscious of or aware of)
> (Pope, 1978, p. 265)." You do not have to explain or justify your thoughts...just
> describe the thoughts you are experiencing.

Instructions for the two thought reports completed following receipt of the Social

Competence Test feedback varied according to experimental condition (see mental

control manipulation instructions included below).

Mental control instructions manipulation check. To determine how much

participants conformed to the mental control instructions provided during the first

(manipulated) think-aloud report, following completion of those think-aloud reports

participants in the experimental conditions (suppression, expression, & concentration)

responded to condition-specific questions concerning how hard they tried to produce the

types of thoughts they were instructed to produce. For example, participants in the suppression condition answered the question, "*How hard did you try not to think about the feedback you received on the social competence test?*" To provide an equivalent number of questions to all participants, those in the "free-monitoring" control condition were asked, "*How hard did you try to verbalize whatever thoughts came to your mind as they occurred?*" Response options for all four conditions range on a 7-point scale from 1 (*not at all*) to 7 (*very hard*).

Transcription and Coding of the Verbal Thought Reports

      Transcription. Participants completed verbal stream-of-consciousness reports during three think-aloud task periods – prior to receiving the SCT feedback, while attempting to control mental contents immediately after receiving the feedback, and again after being released from mental control instruction. However, only the reports produced during and after mental control manipulation were transcribed and coded for thought and emotional content. As a reminder, thought reports produced prior to receiving the feedback were considered a practice period, and were not transcribed or included in any analyses. They were intended solely to familiarize participants with the task.

      Following transcription I divided each transcript into thought segments or statements (see Pope, 1978). Most thought segments consisted of a single sentence or independent clause, containing a clear subject and predicate. Due to the typically ungrammatical nature of verbal stream-of-consciousness reporting, though, many thought segments were constructed from predicates with an implied subject (e.g., "Went shopping. Bought myself a dress.")

Coders. Coding of the transcripts was completed by an undergraduate research assistant, who served as the primary coder, and myself. I initially trained my research assistant on the instructions for coding the transcripts using a sample of transcripts from the practice think-aloud task. During early coding of the experimental transcripts (13% of 158 transcripts), some coding instructions were modified or expanded based on feedback from the primary coder and discussion between us concerning clarifications. This resulted in the final instructions included in Appendix G. Following early coding, the transcripts were coded independently, with the exception of occasional clarification of instructions.

Global affective valence and inter-rater reliability. During coding of the written transcripts, each full transcript was reviewed and given a subjective rating of global affective valence using a scale ranging from -2 (*more negative*) to 2 (*more positive*). The purpose of this score was to capture both the element of emotional intensity and the emotional valence in each transcript as a whole (Wegner, Wenzlaff, & Kozak, 2004). To calculate inter-rater reliability between both coders' ratings of global affect, Cohen's Kappa statistics with linear weighting was computed separately for each experimental group and thought report time period. The kappa statistic was chosen because it is considered appropriate for ratings on an ordinal scale, such as the global ratings of affective valence were. I specifically chose a kappa statistic with linear weighting for the purpose of weighting any "near-misses" between coders' ratings less heavily than disagreements involving more distant values (Agresti, 1990). As is presented in Table 3, obtained kappa statistics ranged from .32 to .78. Although some subgroups obtained strong agreement, others were less than desirable. Therefore, I used the combined average of each coder's ratings for any further analyses.

Coding for feedback mentions. The thought reports were then coded for both direct and indirect mentions of the SCT feedback. Direct mentions of the feedback were considered to be any statements that clearly referred to the Social Competence Test (e.g., "That score can't be right!"). These direct mentions of the SCT feedback in the transcripts were found to be significantly correlated with self-report ratings of time spent thinking about the test feedback, r's(76) = .59 during mental control and .30 after mental control (p's < .01).

Indirect mentions included any statements or references to situations that were thematically related to social competence (e.g., "I usually get along well with others.") (Roemer & Borkovec, 1994). The rationale for inclusion of indirect mentions is that experiencing conscious thoughts about situations involving social competence may reflect preconscious processing or unreported thoughts about the test feedback. Continuing concerns or preoccupations with the feedback might be reflected in both direct references to the feedback and in mentions of social competence in general.

Coding for statement-specific affect. Individual thought segments within each transcript were also coded for positive, negative, or neutral affect. In general, coding for positive or negative affect occurred when a statement included a positive or negative adjective (e.g., happy), verb (e.g., hate), or adverb (e.g., wonderfully), or in other cases where the statement was clearly positive or negative (e.g., "This rocks!"). Coding for neutral affect occurred generally in cases of matter-of-fact statements or ones that were emotionally ambiguous (e.g., "I have a test today").

Inter-rater reliability for statement-specific codes. Interclass Correlation Coefficients (ICC) were calculated for direct and indirect mentions of the SCT feedback,

and for statement-specific affect. The ICC was chosen to compute inter-rater reliability because it is considered appropriate for ratings measured on a continuous scale. Because the combined averages of both coders' ratings were used in further analyses, the obtained correlations presented in Table 4 are the Average Measure ICC's versus the Single Measure ICC's. Obtained ICC's ranged from .80 to 1.0 (all p's < .01) exhibiting strong inter-rater agreement for all groups.

Validity of affect codes. Because the more global affective valence ratings could be considered highly subjective, and therefore more prone to error and bias, I compared them to the affect coding from the individual statements. I first computed the average statement-specific affect score by subtracting the number of negative statements from the number of positive statements found in each transcript, thereby obtaining an overall positive or negative rating for each transcript. I then averaged both the primary coder's and my ratings for global affective valence and the average statement-specific affect score for each transcript. Lastly, I performed a Pearson's correlation between these two variables. Global affect and average affect scores were found to be significantly correlated for both the first and second thought report periods, $r(79) = .89$ and $r(78) = .85$, p's < .01. Thus, there appeared to be strong agreement between the global and specific ratings, suggesting that rater biases were likely no more of an impact on global scores than they could have been on statement ratings.

Mental Control Instruction Manipulations

In the first experimental think-aloud procedure, mental control strategies were manipulated for three of the four conditions. The experimental instructions for the verbal thought reports were designed to create the conditions of suppression, concentration, and

expression. Additionally, the fourth group received "free-monitoring" control

instructions. Participants in the *suppression* condition were asked to avoid thoughts about

the feedback they received from the Social Competence Test:

> For the next five minutes try not to think about the test feedback you just
> received, and try to avoid experiencing any thoughts and feelings you might have
> about the test feedback. Remember, though, to express whatever thoughts you
> notice coming to mind, even if they are related to the test feedback.

> Participants in the *concentration* condition were asked to focus on a specific

memory of some recent favorable feedback, about which they had written prior to

receiving feedback from the Social Competence Test:

> For the next five minutes try to think about the specific memory of favorable
> feedback you described earlier in this session, and notice any thoughts and
> feelings you might have about that memory, including any related favorable
> memories. Remember, though, to express whatever thoughts you notice coming to
> mind, even if they are not related to the memory.

> Participants in the *expression* condition were asked to think about the feedback

they had received on the test:

> For the next five minutes try to think about the test feedback you just received,
> and notice any thoughts and feelings you have about the test feedback.
> Remember, though, to express whatever thoughts you notice coming to mind,
> even if they are not related to the test feedback.

> Participants in the *"free-monitoring" control* condition were given only the

following instructions to report whatever thoughts came to mind:

> For the next five minutes please verbalize your thoughts as before. Remember,
> simply try to report on whatever is going through your mind at the moment
> (whatever you are conscious of or aware of).

Procedure

This study was conducted in two parts – group sessions, followed by individual

one-on-one sessions at least one week later (see Table 2). Participants first assembled in

groups of up to 30 students with a single experimenter, where they were informed that the study was investigating how people process social information. At this time, participants were provided consent forms to sign and were allowed an opportunity to continue in the study or complete an alternate task for course credit. While the experimenter collected consent forms, she handed out experiment packets containing the demographic questions, the BDI, the WBSI, the Social Competence Test, and two social competence self-schema questions. On the front of each packet was located a participant number that was assigned to each participant when they checked in. The participant number was used to keep track of materials throughout the experiment. For the duration of the experiment and processing of the data, the experimenter kept a master list of participants' names and their assigned numbers. Only the participants' assigned numbers were used for identification on all written and recorded experiment materials.

Social Competence Test administration. Participants first completed the demographic questions, the BDI, and the WBSI. After that, the Social Competence Test was introduced with the following explanation:

> You are going to complete the Social Competence Test, a standard and widely used measure of social competence. Social competence involves the ability to accurately assess the complex demands of a social situation and respond comfortably and with accurate understanding of the expectations and characteristics of other individuals involved in the interaction. The test consists of three parts that assess social behaviors, degree of comfort in social interactions, and projected responses to sample social situations. Please, respond as honestly as possible to the questions because you will receive feedback based on your responses when you return to meet individually with an experimenter.

After completing the Social Competence Test, participants completed the two questions that served as indices of social competence self-schemata. Upon completion of the measures, participants were informed that it would take up to a week to obtain the

scores from the test, and they were given the opportunity during the group session and later via posted sign-up sheets to sign up for the one-on-one sessions that could be scheduled for at least one week after completion of the initial group session.

    Individual session introduction. Individual one-on-one sessions began one week after initial group sessions. These took place in small rooms, in which there was located one table and chairs for the experimenter and participant. On the walls of these rooms were also located a chalkboard and a two-way mirror, which were not used for the experiment. Participants were seated with their backs facing the mirror to reduce the impact it might have on their behaviors, and if asked about the mirror, the experimenter explained that it was a two-way mirror, but that observation was not part of the study. Participants' initial consent forms were then reviewed, and they were provided a second opportunity to withdraw from the study. During review of the consent forms, participants were reminded that they would be receiving feedback from the Social Competence Test, completing several questionnaires about their mood and thought content, and audiotaping their thoughts several times.

    Experimental group assignment. Following an introduction to the individual session, participants then completed the BDI for a second time, were asked to write about a previous positive and negative feedback experience, and then were given instructions to complete their first verbal thought report. During this practice think-aloud task, the experimenter took the experiment booklet out of the room to be able to score the BDI without the participant's knowledge and randomly assign each participant to one of four possible mental control conditions, or to the excluded group if the BDI score was above 15.[1] Following the practice think-aloud task, if a participant had been excluded because

of BDI score or because of determination by the experimenter that there was a significant problem with English fluency, they were informed that they were assigned to a group for which they had completed all that they needed to do. They were then told what tasks they would have completed had they been assigned to one of the other groups, including getting bogus test feedback and applying various strategies to coping with that feedback while recording their thoughts. Finally, they were fully debriefed and given full credit for participation.

Describing previous feedback experiences. After completion of the BDI, participants were instructed to briefly write about a recent instance when they had received favorable feedback and about another experience in which they had received unfavorable feedback. The purpose of the written descriptions was to provide target thoughts for the concentration strategy condition during the first experimental think-aloud procedure. Participants assigned to the concentration instructions were asked to verbally report their thoughts while concentrating on memories of the favorable feedback experience.

The description of the negative feedback memory that participants provided was not used during the experimental manipulations. However, it was included for two primary purposes: (1) to decrease any suspicions about the purpose of the positive feedback recollection, and (2) to decrease the risk that accessing memories of positive feedback would inhibit the later processing of the negative feedback they would receive from the Social Competence Test.

The experiment booklet provided written instructions for describing an instance of favorable feedback, followed by instructions for describing the unfavorable feedback. The instructions were printed as follows:

> Try to recall a recent experience in which you received some kind of favorable or positive feedback. Some examples of favorable feedback include (but are not limited to): compliments, good school performance, acceptance by others, or positive achievement. In just 2 – 3 sentences, briefly describe the nature of the feedback and how it made you feel.

> Try to recall a recent experience in which you received some kind of unfavorable or negative feedback. Some examples of unfavorable feedback include (but are not limited to): negative criticism, failure, poor school performance, or rejection from a friend, new acquaintance, or romantic partner. In just 2 –3 sentences, briefly describe the nature of the feedback and how it made you feel.

Following each description, participants were asked to respond to the following item: "*Please rate on the following scale how strongly this feedback experience made you feel*." They responded on a 9-point scale ranging from 1 (*very upset*) through 5 (*neutral*) to 9 (*very happy*). The purpose of these ratings was to serve as a manipulation check verifying that participants were describing positive and negative experiences as directed.

Practice think-aloud procedure. At three points during the session participants completed a think-aloud procedure in which they were asked to think out loud for five minutes while their thoughts were recorded on a cassette recorder. The first think-aloud period served as practice, while the other two think-aloud periods served as the measures of stream-of-consciousness. The purpose of the practice think-aloud period was to familiarize participants with the general procedure. This follows recommendations from a follow-up study to the Wegner, Schneider, Carter, and White (1987) white bear suppression experiment, in which Carter, Wegner, and Schneider (1987, as cited in Wegner et al., 1987) reported that participants' mentions of the target thought (i.e., a

white bear) during suppression periods was reduced if participants had not previously

practiced the think-aloud procedure. They suggested that the reduced reporting may result

from lack of familiarity and experience reporting thoughts aloud or because of the need to

become comfortable with the setting before getting involved in the experimental task. It

may also be that without prior practice, the complexity of learning a new task (i.e.,

thought reporting) and being instructed simultaneously to avoid thoughts about

something may be confusing to participants.

The experimenter introduced the practice think-aloud procedure by telling

participants the following:

> Now I am going to ask you to describe whatever thoughts you are experiencing
> for five minutes. What you say will be recorded on this tape-recorder. While you
> are recording your thoughts, I will be outside the room to keep from interfering.
> Your recording will be kept completely confidential and will only be identified by
> your participant number written and recorded on the cassette.

Participants were then provided the general instructions adapted from Pope (1978)

concerning how to report on their stream-of-consciousness. After explaining the task, the

experimenter allowed the participant the opportunity to ask questions. She then gave the

following instructions:

> Remember to speak your thoughts into the recorder as you experience them. Try
> to speak fairly continually for the next five minutes. I will return at the end of five
> minutes.

She then started the cassette recorder, left the room, and began timing for five

minutes before returning to the room and turning off the recorder.

Feedback on the Social Competence Task. Following the practice thought report,

the experimenter informed each participant that she was going to review the feedback

from the Social Competence Test with them. She then read the following statement

concerning social competence:

> Social competence involves the ability to accurately assess the complex demands of a social situation and respond comfortably and with sensitivity to other individuals involved in the interaction. It is an extremely important skill and is the basis of healthy, well-adjusted relationships. We know that people who are high in this ability tend to be well-liked and to be rated by others as popular and socially desirable. People high in social competence can generally maintain stable and satisfying relationships with others.

After that, the experimenter would pull a computer printout out of the participant's packet

and present it as the score report (Appendix H). Participants were informed that the

Social Competence Test is a normed test, meaning that their performance was judged

relative to other test-takers in their age group. Each participant was told that the

maximum attainable points were 140, and that the average score for college students is

115 (75th percentile). However, their own scores were reported to be 89 (55th percentile),

meaning that they performed better than 55 percent of test-takers in the general

population but below average for college students (see Appendix H).

Following the feedback, the participants completed the two manipulation check

questions concerning their perceptions of the feedback. They then completed the first

administration of the PANAS to obtain a baseline measure of affect prior to the

experimental manipulations of mental control strategies.

Experimental think-aloud procedure. Following the test feedback, participants

completed the experimental think-aloud procedure, for which they were randomly

assigned to either the suppression, concentration, expression, or control instructions. For

the three manipulated conditions, the think-aloud task was introduced using the following

instructions from Harnden, McNally, & Jimerson (1997, p.287): "For the next five

minutes please verbalize your thoughts as you did before, but with one exception." They then received condition-specific instructions either to avoid thinking about the test feedback, concentrate on the written recollection of positive feedback, or express thoughts about the test feedback. Participants in the "free-monitoring" control condition were given instructions to again report whatever thoughts came to mind.

The experimenter again left the room and timed participants while they recorded their thoughts for five minutes. After the think-aloud procedure was completed, participants responded to the written questions about the amount of effort applied to following the instructions and the amount of time spent thinking about the test feedback.

Final think-aloud procedure. Participants completed a final think-aloud procedure, in which all participants received the same instructions:

> Again, for the next five minutes please verbalize your thoughts as you did before. Remember, simply try to report on whatever is going through your mind at the moment (whatever you are conscious of or aware of).

Participants who had received one of the three experimental instructions were additionally told either that they no longer had to try to avoid thinking about the test feedback (suppression), that they no longer had to try to think about a specific memory of favorable feedback (concentration), or that they no longer had to try to think about the test feedback (expression).

Following completion of the final think-aloud procedure, participants again answered a question about the amount of thought spent on the test feedback and completed the PANAS. They then responded to the three questions concerning their perceptions of the test feedback. The experimenter debriefed them fully on the nature of the study and, in particular, the inaccuracy of the feedback they received. Participants

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were given the opportunity to report to the experimenter how they felt about receiving

false feedback and to ask any questions about the study. They were then given full credit

for participation in both parts of the study.

Chapter IV: Results

The primary expectation of this study was that both expression and concentration strategies would prove to be more effective than suppression for coping with negative social feedback. Specifically, although a suppression strategy would appear to effectively control cognitive reactions to the negative feedback during mental control, it was expected to produce a greater number of feedback-related thoughts, more negative affect, and less positive affect relative to the other strategies following cessation of mental control efforts. During initial mental control efforts the mental contents of the group asked to concentrate on memories of positive feedback were expected to be the most positive and not significantly differ from the suppression group in number of mentions of the negative feedback. In contrast, those asked to express thoughts about the negative feedback would have the most negative and feedback-related thoughts during mental control. Following the conclusion of mental control efforts both the expression and concentration strategy conditions were expected to demonstrate relatively low occurrences of test-feedback cognitions and related negative affect.

Sample Characteristics

Of the 90 participants who began the study, 79 completed both the group and the individual sessions. Out of the original 90 participants, one was released from the study because he scored above 15 on the group administration of the Beck Depression Inventory (BDI). He was then offered participation in an alternate study to complete class credit and was later debriefed via email about the nature of this study. Another participant was released after the start of the individual session because she had indicated on her group session booklet sometimes having difficulty communicating in English, and the

administrator was able to verify verbal English communication difficulties. This participant was debriefed at that time and given full credit for study participation. The remaining nine participants who did not complete the study either did not schedule or did not attend a scheduled individual session.

To evaluate the effect of attrition on the study sample, the scores obtained on several group session measures by the 11 participants who did not complete the study were compared to scores obtained by those who did complete the study. A One-Way ANOVA revealed significant differences between study completers and non-completers on a self-rating of social competence, $F(1, 85) = 11.79$, $p < .01$, suggesting some bias concerning who attrited. Participants who did not complete the study reported lower social competence ($M = 3.0$, $SD = 1.41$) than did those who completed the study ($M = 4.13$, $SD = .96$), p's $< .05$. There were no significant differences between study completers and non-completers on ratings from the White Bear Suppression Inventory and self-ratings of the importance of social competence (F's < 1), or the group session BDI, $F(1, 85) = 1.77$, $p > .05$. Additionally, on the demographics of age and sex, there were also no significant group differences (F's < 1).

Of the 79 participants who completed the study, the data for two of them were excluded from all analyses except for calculations of inter-rater reliability because of experiment administration errors. These errors occurred during the individual administrations, and included completing measures out of order for one participant and incorrect timing of the think-aloud tasks for the other. A third participant, who had been in the control condition, was also excluded because she expressed a sufficient level of irritation about being in the study during the think-aloud tasks and after the experiment to

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suggest that her data might be biased. As a further test of this conclusion, I reviewed the scores on her transcripts, and found that she was the only participant to receive the lowest possible global emotional intensity rating from both coders for both think-aloud periods.

The remaining sample of 76 participants consisted of 55 females (72.4 percent) and 21 males (27.6 percent) ranging in ages from 18 to 35 ($M = 21.4$, $SD = 2.62$). Fifty-six of these participants were identified as Caucasian, 3 as Hispanic, 10 as Asian, none as African-American, and 7 as Other Ethnicities. Seventy-three of these participants identified themselves as Native English speakers. Of the three who reported speaking English as a second language, two reported speaking English fluently, and one reported some difficulty communicating in English. For that final participant, the administrator was able to determine at the time of the individual session that she was verbally fluent enough to express her thoughts sufficiently during the think-aloud tasks and complete the study.

Tests of Sex Effects on Self-Report Measures

To evaluate the impact of sex on all self-report measures, I conducted a series of two-tailed *t* tests comparing male and female participants on all baseline measures, manipulation checks, and self-reported thought content and affect (PANAS). Analyses revealed a significant effect for sex on self-ratings of the importance of social competence, $t(74) = -3.184$, $p < .01$. On average female participants rated being socially competent as more important ($M = 4.2$, $SD = .7$) than did male participants ($M = 3.6$, $SD = .67$). For all other self-report measures there were no significant effects of sex (p's > .05). Despite the significant effect of sex on social competence self-ratings, I did not include sex as a factor in further analyses because there were too few males per condition

(3 to 8) to allow for a meaningful examination of sex by condition effects on self-report measures. Therefore, for all further tests of the self-report measures I collapsed analyses across sex.

Tests of Sex Effects on Verbal Thought Report Measures

I evaluated the potential impact of sex on the thought report variables in a series of 2 x 2 repeated measures ANOVA's, with sex as the between-subjects factors and think-aloud task period (time 1/time 2) as the within-subjects factor. For indirect mentions of the SCT feedback, there was a significant effect for sex, $F(1, 74) = 8.83$, $p < .01$, but no interaction with time, $F < 1$. The estimated marginal mean for female participants was 11.83($SE = 1.04$) compared to males ($M = 5.98$, $SE = 1.68$), indicating that female participants generally expressed more indirect thoughts related to social competence than did males. Female participants also produced marginally significantly more negative statements ($M = 9.92$, $SE = .63$) than did males ($M = 7.74$, $SE = 1.02$), $F(1, 74) = 3.29$, $p = .07$, but there was no interaction with time, $F < 1$. For all other variables, there were no significant effects for sex, p's > .05. As with the self-report measures, although there were effects of sex on indirect references to social competence and the expression of negative statements, the small number of males in each experimental condition prevents meaningful analysis of sex interactions with group. Therefore, sex was not included as a factor in any further analyses of thought report variables.

Tests of Baseline Measures and Manipulation Checks

Tests of Group Differences on Baseline Measures

To test for group differences on the self-report measures completed prior to mental control manipulation, I ran a series of One-Way ANOVA's using experimental

condition (suppression, expression, concentration, control) as the sole between-subjects factor.

Beck Depression Inventory. Participants completed the BDI during the group administration and at the beginning of the individual administration to screen for depression symptoms. For both the group and the individual administrations of the BDI there were no significant differences between groups (F's < 1).

White Bear Suppression Inventory (WBSI). Participants completed the WBSI during the group administration. Scores on the WBSI can range from 15 to 75, and the obtained scores for the 76 participants retained for analyses ranged from 20 to 61 ($M =$ 43.93, $SD = 9.65$). A One-Way ANOVA revealed no significant differences between experimental groups on WBSI scores, $F < 1$.

Self-ratings of social self-esteem. Participants' group session ratings of how socially competent they viewed themselves and how much they valued the concept of social competence represented a potential preexisting factor of social self-esteem that could impact their perceptions of and reactions to the feedback from the Social Competence Test (SCT). An evaluation of mean ratings for on both questions showed that participants generally reported moderately high social self-esteem ($M = 4.13$, $SD =$ .96) and valuation of social competence ($M = 4.03$, $SD = .73$). I compared experimental groups on the ratings of social self-esteem and the importance of social competence and found no significant differences between groups (F's < 1).

Self-ratings of positive and negative affect. Participants completed the Positive Affect and Negative Affect Schedule (PANAS) immediately after receiving the SCT feedback and received separate scores for both negative affect (NA) and positive affect

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(PA). One-Way ANOVA's revealed no significant differences between experimental groups on either PA or NA (F's < 1) (see Table 5 & Figure 1).

Tests of Group Differences on Manipulation Checks

  Positive and negative feedback memories. During the individual administration sessions, participants briefly described and then rated memories of positive and negative feedback. To determine how effectively participants' positive feedback memories would serve as positive target thoughts for the concentration condition, I compared the mean of the positive feedback memories ($M = 7.89$, $SD = .9$) to that of the negative feedback memories ($M = 3.08$, $SD = 1.16$) in a paired samples t test. As a reminder, participants' ratings of the memories could range from 0 (*very upset*) to 9 (*very happy*). The results showed that ratings of positive feedback memories were significantly higher than ratings of negative feedback memories, $t(75) = 29.98$, $p < .01$, suggesting that the positive memories were fairly positive, particularly when contrasted with what participants would consider a negative experience.

  In a series of One-Way ANOVAs, I compared experimental groups on ratings of positive and negative memories. The analyses revealed no significant differences between groups on positive and negative memory ratings, F's$(3, 72) = 1.48$ and 1.52, respectively, p's > .05.

  Social Competence Test feedback. In order to determine how effective the SCT feedback was for providing a negative social feedback experience, I examined participants' ratings on the following questions presented immediately after participants received the feedback: "*In general, how socially competent does the test describe you as being?*" and "*How favorable do you feel the feedback was for you?*" Perceived

competence was rated on a scale from 1 (*very socially incompetent*) to 5 (*very socially competent*), and the mean rating of 3.16 (*SD* = .83) suggests that, on average, participants perceived that the feedback described them as no more competent than incompetent. Yet, they generally rated the feedback as slightly unfavorable, with an average rating of 3.38 (*SD* = 1.17) on a scale ranging from 1 (*not at all favorable*) to 7 (*very much favorable*). Because the feedback they received described them as slightly above average for the general population, but below average for the college population, it would be expected that participants would consider the feedback to be only a moderate critique of their social abilities.

One-Way ANOVA's comparing experimental groups on their ratings of perceived competence and feedback favorability revealed no significant differences between groups on either rating, (*F*'s < 1).

Mental control instruction compliance. In order to verify that participants complied with the mental control instructions provided for the first experimental think-aloud task, I examined participants' ratings on condition-specific questions concerning how hard they tried to conform to the mental control instructions when they were reporting their thoughts. On average, participants rated their level of effort as 4.28 (*SD* = 1.49) on a scale ranging from 1 (*no effort*) to 7 (*very much effort*). Therefore, it appears that participants generally applied a moderate amount of effort toward performing the task as instructed.

A comparison of experimental groups in a One-Way ANOVA revealed a significant effect for group on ratings of instruction compliance, $F(3, 71) = 5.92, p < .01$. Follow-up comparisons revealed that the suppression group reported applying

significantly less effort toward following instructions ($M = 3.17$, $SD = 1.42$) than did the expression ($M = 4.94$, $SD = 1.30$) or control groups ($M = 4.65$, $SD = 1.27$), p's $< .01$, and marginally significantly less than the concentration group ($M = 4.32$, $SD = 1.45$), $p = .06$. Although it is not clear why the suppression group would differ from the other groups on efforts to comply with instructions, it is possible to speculate that the abstractness of instructions to "try not to do something" may make it more challenging to evaluate one's efforts. In other words, suppressors may not have perceived that they were applying much effort to avoiding thoughts about the test feedback. This issue will be explored further in the general discussion.

Tests of Hypotheses

My hypotheses included predictions concerning both self-reported and expressed affect and thought content during mental control manipulation and after mental control was relinquished. To test my hypotheses concerning self-reported affect, affective valence of thought content, and feedback-related thoughts during mental control manipulation, I conducted a series of One-Way ANOVA's and a priori contrasts to assess predicted differences between specific groups. For all analyses of post-mental control variables, I selected One-Way ANCOVA's and a priori contrasts to compare groups while controlling for variance associated with the Time 1 variables. The primary purpose of selecting the ANCOVA was to provide a more powerful significance test and a larger effect size by allowing evaluation of the variance shared by the experimental group residual and each Time 2 dependent variable's residual, minus the interference of the shared variance with the Time 1 covariates (see discussion in Miller & Chapman, 2001).

For all of the ANCOVA's, I chose to perform a priori contrasts for the individual group comparisons, regardless of the significance of the reported omnibus F. In having selected the appropriate number of contrasts to most closely mirror my hypotheses, I acknowledge that I have increased the experiment-wide chance of Type I errors. However, I have chosen this less conservative approach to individual group comparisons to allow for adequate exploration of the impact of the experiment manipulations, in light of the fact that the labor intensive nature of this study resulted in a relatively small sample size and reduced power.

Tests of Group Differences on the Self-Report Ratings of Thought Content

Participants completed self-report ratings of how much time they had spent thinking about the SCT feedback immediately following each of the two think-aloud tasks. My hypotheses for self-reported time spent thinking about the SCT feedback included separate predictions for the first (during mental control) and the second (after mental control) thought report periods.

First thought report period. For the first period, while under mental control instructions, I predicted the following: **1) The suppression and concentration groups would each report less time thinking about the test feedback than the control group, and 2) the expression group would report more time thinking about the test feedback than each of the other groups.** A One-Way ANOVA comparing the four groups revealed significant differences between groups on the self-reported time spent thinking about the feedback, $F(3, 71) = 11.77$, $p < .01$ (see Table 6 & Figure 2). A priori contrasts were performed to compare the suppression and concentration conditions to the control, and the expression condition to each of the other groups. As expected,

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participants instructed to express thoughts about the test feedback reported significantly more time thinking about the feedback than did each of the other groups (p's $< .05$), and those instructed to suppress thoughts about the feedback reported less time thinking about the feedback than did the control group ($p < .01$). However, contrary to predictions, the concentration group did not significantly differ from the control group ($p > .05$). Thus, both the expression and suppression groups performed as expected during mental control; however, the strategy of focusing on a positive feedback memory was not as effective as anticipated at controlling thoughts about the negative SCT feedback.

      Second thought report period. For the second period, following release from mental control instructions, I predicted: **1) The suppression group would report more time thinking about the test feedback than each of the other groups, and 2) the expression and concentration groups would each report less time thinking about the SCT feedback than the control group.** A One-Way ANCOVA comparing the four experimental groups revealed marginally significant differences between groups on self-reported time spent thinking about the feedback, $F(3, 70) = 2.47$, $p = .07$ (see Table 6 & Figure 2). Individual comparisons between the suppression group and each of the other groups were performed, as well as comparisons of the expression and the concentration groups to the control group. As expected, the expression group did report significantly less time thinking about the feedback than did the control group ($p < .01$), and marginally significantly less time than the suppression group ($p = .09$); however, contrary to expectations, the amount of time thinking about the test feedback as reported by the concentration or suppression groups did not significantly differ from the time reported by the control group (p's $> .05$). In fact, the suppression group mean demonstrated a

nonsignificant trend of being lower than that of the control group. Therefore, according to self-report, prior suppression did not cause an increase in time spent thinking about the test feedback, and prior concentration did not cause a decrease.

Tests of Group Differences on SCT Feedback Mentions in the Verbal Reports

Participants verbally reported their thoughts for five minutes while attempting mental control after receiving the bogus negative SCT feedback, and again after they were released from mental control instructions. The reports were coded for direct references to the feedback, as well as indirect references to thematically related thoughts. Analyses of indirect mentions are included below solely for exploratory purposes. As with the self-reported thought content, my hypotheses for direct mentions of the SCT feedback included separate predictions for the first (during mental control) and the second (after mental control) thought report periods.

Mentions of the SCT feedback during mental control. For the first thought report period I predicted that **1) the suppression and concentration groups would each demonstrate fewer thoughts about the SCT feedback than either the expression or control groups, whereas 2) the expression group would exhibit the greatest number of such thoughts.**

I conducted two One-Way ANOVA's to compare experimental groups' average direct and indirect mentions during mental control. The analyses revealed that the groups significantly differed on the average number of direct mentions, $F(3, 72) = 12.82$, $p < .01$, (see Table 7 & Figure 3) but not on the average number of indirect mentions, $F < 1$ (see Table 7). As predicted, direct mentions of the feedback occurred significantly more often in the expression condition than in each of the other conditions (p's $< .05$); however,

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contrary to expectations, the mean number of direct mentions made by the suppression

and concentration conditions were not significantly lower than control (p's > .05).

Mentions of the SCT feedback following mental control. For the second thought

report period I predicted that **1) the suppression group would make the most mentions**

of the test feedback, relative each of the other groups, whereas 2) the expression and

concentration groups would each make fewer mentions of the feedback than the

control group. I conducted two One-Way ANCOVA's – the first analyzed Time 2 direct

mentions of the test feedback while covarying out the effects of direct mentions made

during mental control, whereas the second assessed indirect mentions of the feedback at

Time 2 while controlling for indirect mentions made during mental control. There were

no significant differences between groups for either direct or indirect mentions of the

SCT feedback, F's(3, 71) = 2.03 and 1.17, respectively, p's > .05; however, individual

comparisons of the suppression group to each of the other groups did reveal that, as

predicted, the suppression group made more direct references to the test feedback than

did either the expression or control groups, p's < .05 (see Table 7 & Figure 3). In other

words, the suppression group experienced more intrusive thoughts after being released

from mental control instructions than did the control group or those who had expressed.

Contrary to predictions, though, the expression and concentration groups did not make

significantly fewer direct mentions than control (p's > .05).

Tests of Group Differences on the Self-Report Ratings of Affect

Besides completing the PANAS immediately after receiving their SCT feedback,

participants also completed the PANAS following the final think-aloud task. The scores

on the initial PANAS served as baseline measures of affect; therefore, I had no

hypotheses for that time. For the final PANAS scores, I predicted that **1) those who had suppressed would report higher negative affect and lower positive affect than each of the other groups, and 2) the expression and concentration groups would experience higher positive affect and lower negative affect than the control group.** I conducted two One-Way ANCOVA's using the baseline PA scores as a covariate for the dependent variable of the final positive affect score, and baseline NA scores as the covariate for the dependent variable of the final negative affect score. There were marginally significant differences between experimental groups on the final PA scores, $F(3, 70) = 2.33$, $p = .08$, and no differences between groups on NA, $F < 1$ (see Table 5 & Figure 1). A priori contrasts were performed to compare suppressers with each of the other groups, and compare the expression and concentration groups with the control. Individual comparisons of groups on PA demonstrated that only the concentration group achieved significantly higher PA scores than did the control group following the final think-aloud task ($p < .05$). The concentration group PA was also marginally higher than the suppression group ($p < .1$). Thus, the performance of the concentration group on scores of positive affect partially supported expectations. However, contrary to expectations, the expression group failed to perform better than the control or suppression groups (p's $> .05$). Contrary to expectations, no group differences were found for negative affect (p's $> .05$).

Tests of Group Differences on Affect in the Verbal Thought Reports

My hypotheses for the expression of affect in the verbal think-aloud tasks included separate predictions for the occurrence of positively and negatively-valenced

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statements, and ratings of the valence and intensity of affect in the thought reports as observed by independent raters.

Negative statements during mental control. The affective valence of participants' thoughts was measured as the number of negatively and positively valenced statements they made in a thought report. For the expression of negative affect, I predicted that **1) the concentration group would produce the least number of negative statements during mental control, relative to each of the other groups, whereas 2) the expression group would produce the greatest number of negative statements, relative to each of the other groups.** I conducted a One-Way ANOVA comparing experimental groups on the number of negative statements they produced in the first thought reports and found that the group differences were significant, $F(3, 72) = 2.77$, $p < .05$. A priori contrasts confirmed that the concentration group expressed significantly fewer negative thoughts than the control group ($p < .05$): However, concentration failed to produce fewer negative thoughts than the suppression or expression groups (p's $> .05$) (see Table 8 & Figure 4). Thus, the concentration group only partially confirmed predictions. Also, contrary to expectations, the expression group did not demonstrate the greatest amount of negatively valenced content relative to each of the other groups (p's $> .05$). In fact, the expression group mean of 8.72 (5.46) was lower than that for the control group ($M = 10.93$, $SD = 5.78$), although this difference did not approach statistical significance ($p > .1$).

Negative statements following mental control. For the second thought report period I predicted that **1) those who had suppressed thoughts of the test feedback would now express more negative thoughts than each of the other groups, and 2)**

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those who had concentrated on a positive memory or who hade previously expressed thoughts about the feedback would have fewer negative thoughts than the control group. I compared experimental groups' formation of negative statements in a One-Way ANCOVA, using the number of negative statements formed during in the first thought report as a covariate. Contrary to expectations, there were no significant differences between experimental groups, $F < 1$ (see Table 8 & Figure 4). Therefore, it appears that prior mental control manipulations did not differentially impact the number of negative statements expressed by each group during the second think-aloud task.

Positive statements during mental control. For the expression of positively-valenced thoughts during mental control efforts, I predicted that **those asked to concentrate on a memory of positive feedback would express more positive thoughts than each of the other groups.** I conducted a One-Way ANOVA and found that experimental groups did differ significantly in the amount of positive statements expressed, $F(3, 72) = 6.64$, $p < .01$ (see Table 8 & Figure 4). Post hoc comparisons confirmed expectations, in that the mean number of positive statements for the concentration group proved to be significantly higher than those of the expression group ($p < .01$), as well as the suppression and control groups (p's $< .05$).

Positive statements following mental control. For the second thought report, I expected that the mental control conditions would perform similarly to expectations for positive affect on the PANAS. Therefore, I predicted that **1) those previously asked to suppress would experience fewer positively valenced thoughts than each of the other conditions, whereas 2) those previously asked to concentrate on a positive feedback memory or express thoughts about the test feedback would report the greatest**

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number of positive thoughts. To test this possibility, I compared groups in a One-Way ANCOVA, using the average number of positive statements formed in the initial thought reports as a covariate. The analysis revealed no significant differences between groups on the number of positive statements formed, $F < 1$ (see Table 8 & Figure 4). Much like the expression of negative statements, it appears that manipulating mental control strategies did not impact the expression of positive thoughts during the second think-aloud task.

Global affective valence ratings during mental control. For the coders' global ratings of affective valence, my expectations were similar to those for the valence of statements in the thought reports. For the first thought report period I expected that, **1) the expression condition would receive lower ratings, representing more negativity, than each of the other groups, and 2) the concentration group would receive the highest ratings, reflecting more positivism, relative to each of the other groups.** To test this hypothesis, I conducted a One-Way ANOVA comparing experimental groups' ratings of global affect. I found that there were significant differences between groups, $F(3, 72) = 10.2$, $p < .01$, with individual group comparisons revealing that the concentration group obtained higher ratings than did each of the other groups (p's $< .01$) (see Table 9 & Figure 5). Thus, as expected, the concentration group was rated as being more positive, on average, than each of the other groups. However, although the mean for the expression group demonstrated a trend toward being the most negative, it was not significantly lower than the control or suppression groups (p's $> .05$).

Global affective valence ratings following mental control. For the final thought report I anticipated that, **1) the suppression group would receive more negative ratings than each of the other groups, and 2) the concentration and expression**

groups would each receive more positive ratings than the control group. To compare the experimental groups I conducted a One-Way ANCOVA using the global affect ratings from the first thought report period as a covariate. The resulting model produced no significant differences between groups, $F < 1$ (see Table 9 & Figure 5). Thus, as with statement-specific affect ratings, prior manipulation of mental control strategy did not appear to later differentially impact the global affective valence of thought content in the second thought report.

Exploratory Tests of Group Differences on Perceptions of the Test Feedback

I performed several exploratory analyses comparing the experimental strategy groups on their end-of-experiment perceptions of the test feedback. The purpose of these analyses was to explore the possibility that the manipulation of mental control strategies might differentially impact memories of the feedback that participants had received, thus reflecting strategy-related biases in recall.

Perceived Competency and Favorability Ratings

Participants rated their perceptions of how competently and favorably the SCT feedback described them immediately after receiving the feedback and again at the end of the experiment. I entered the final competency and favorability ratings into two One-Way ANCOVA's, controlling for their associated baseline ratings from immediately following reception of the feedback. For neither perceived favorability nor competency were there significant differences between groups, F's(3, 71) = .47 and 1.42, respectively, p's > .05; however, for perceived competency ratings, the expression group ($M = 3.39$, $SD = .92$) did demonstrate a marginally significant trend toward perceiving the feedback as portraying more social competence than did the control group ($M = 2.9$, $SD = .72$) ($p =$

.08). Overall, though, there did not appear to be an effect of prior mental strategy manipulation on memories of feedback favorability or perceived competency.

Perceived Accuracy Ratings

At the end of the experiment participants were additionally asked to rate how accurately the SCT feedback described them on a scale ranging from 1 (*not at all accurately*) to 7 (*very accurately*). The average accuracy rating across groups was 3.01(1.59), suggesting that participants generally considered the negative feedback from the SCT as a less than accurate evaluation of their social competence. I compared experimental groups' accuracy ratings in a One-Way ANOVA, and found no significant differences between groups, $F < 1$. Thus, manipulation of mental control strategy did not appear to impact participants' perceptions of test feedback accuracy.

Interrelationships between Experimental Variables

I explored the potential relationships between several key variables in this study. I first looked at participants' perceptions of the feedback to obtain more information concerning how participants interpreted the feedback, what variables impacted those interpretations, and how effective the feedback was as a source of target thoughts for mental control. I then explored the relationships between expressed thought content and affect to evaluate the possible associations between thought and mood, and to determine if these associations varied across strategies. Next, because there is little evidence in previous research showing the effectiveness of measuring affect in stream-of-consciousness reports, I looked at the relationships between expressed affect and self-reported affect to determine the extent to which they were measuring the same constructs.

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Lastly, I explored the relationships between self-reported thought content and SCT feedback thought intrusions in the stream-of-consciousness reports.

Participant Reactions to the SCT Feedback

Research has found that several factors impact the likelihood that individuals will accept or reject personality interpretations and feedback. In particular, feedback favorability, the congruence of the feedback to an individual's current mood and self-concept, and motivations to view oneself positively on the evaluated construct seem to make a difference (see, Snyder, Shenkel, and Lowery, 1977; Ingram, 1984a; Sanitioso and Wlodarski, 2004). To determine how pre-existing client variables and the nature of the feedback may have interacted to influence participants' responses to the feedback, I correlated participants' self-ratings of their social competence and the importance of social competence with their ratings of how favorably, socially-competently, and accurately they perceived the SCT feedback described them. Table 10 presents the resultant Pearson correlations. Participants' ratings of their own social competence, which might be thought of as their "social self-esteem," were significantly positively correlated with how important they reported the construct of social competence was to them ($p < .01$); however, social self-esteem was negatively correlated with ratings of feedback favorability and accuracy at the end of the experiment (p's $< .05$ and $.01$, respectively). Thus, it appears that participants with higher social self-esteem tended to view the feedback as less favorable and less accurate, possibly because it ran contrary to their current motivations or active self-concept. In other words, there may have been a tendency for those with higher social self-esteem to reject the negative social feedback they were given in the present study.

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Thought Report Variables

I explored the relationships between mentions of the feedback, statement-specific affect, and global affective valence ratings across thought report times and within experimental groups. The purpose of exploring these relationships was to determine if 1) the occurrence of thought intrusions is associated with changes in affect, and if 2) the occurrence of thought intrusions is more likely in the presence of thematically related thought content (i.e., indirect intrusions). The correlations reported below represent only significant relationships of theoretical interest. Correlations between thought report variables within each experimental group are reported in Tables 11 and 12. Correlations with intrusive thoughts that occurred during mental control are listed in Table 11, whereas correlations with intrusive thoughts that occurred following mental control are listed in Table 12.

For the sample as a whole, direct mentions of the test feedback were negatively correlated with positive statements during mental control manipulation, $r(76) = -.28$, $p = .02$,. However, there were no significant correlations between direct mentions and positive statements for any of the specific groups ($|r$'s$| < .38$). There was also a negative correlation for the whole sample between direct mentions and global affective valence ratings during mental control manipulation, $r(76) = -.32$, $p < .01$. Thus, there appeared to be a tendency for more mentions of the test feedback to be related to lower positive affect during the first thought report period. Looking at these relationships within each experimental group, it appeared that the concentration and suppression groups were carrying this effect. Only the concentration and suppression groups had significant negative correlations between direct mentions and global affective valence, r's$(19) = -$

.69, ($p < .01$) and -.49, ($p < .05$), respectively. The correlations for the expression and control conditions did not approach significance (r's < .09). It appears that the occurrence of intrusive thoughts during concentration on a positive feedback memory or suppression of the negative test feedback was associated with worsening affect.

Only the suppression group demonstrated a significant positive correlation between direct mentions of the feedback and negative statements during the first thought report period, $r(19) = .73$, $p < .01$. For all other groups the correlations did not approach significance (r's < .42). Thus, it appears that only thought intrusions that occur during suppression are associated with increased negative affect.

When looking at the relationships between thought report variables in the second thought report period and across report periods, I found that, for the suppression condition only, mentions of the feedback made during mental control were significantly positively correlated with negative statements expressed following mental control, $r(19) = .46$, $p < .05$. In other words, thought intrusions that occurred during suppression were associated with increased post-suppression negative affect. Additionally, mentions of the feedback that occurred after suppression ceased were negatively correlated with the expression of positive statements in that same time period, $r(19) = -.49$, $p < .05$. Therefore, post-suppression intrusions were associated with decreased post-suppression positive affect. In contrast, for participants in the expression condition, post-expression intrusions were positively correlated with positive statements in the same thought report period, $r(18) = .46$, $p < .05$. The expression condition also demonstrated a significant positive relationship between post-expression direct and indirect mentions, $r(18) = .47$, $p < .05$. Thus, following expression of thoughts about the test feedback, intrusive thoughts

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tended to be associated with higher positive affect and more references to issues thematically related to social competence.

Correlations between Thought Report Variables and the PANAS

I examined the correlations between the stream-of-consciousness report variables and the end-of-experiment PANAS to explore relationships between expressed thought content (i.e., mentions, positive statements, negative statements), observer ratings of affect, and self-reported affect. In particular, I was interested in identifying any associations between intrusive thoughts and self-reported affect, and determining the extent to which the various measures of affect were measuring the same constructs. Across groups, the number of positive statements and the global affective valence ratings for the second thought report period positively correlated with PA, r's(76) = .32 and .38, respectively, p's < .01. Thus, there appeared to be significant overlap between all measures of positive affect. For negative affect, however, only the global affective valence ratings following mental control were negatively correlated with NA across groups, $r(76) = -.32$, $p < .01$, showing that more positive observer ratings of affect were associated with less self-reported negative affect. Negative affect in statements following mental control was only marginally significantly correlated with NA, $r(75) = .21$, $p = .07$. In other words, for measures of negative affect following mental control, there was only significant overlap between observer and self-report ratings of negative affect. For the suppression group only, direct mentions occurring after the release from mental control were negatively correlated with PA, $r(19) = -.48$, $p = .04$, mimicking the negative relationship observed earlier between post-suppression direct mentions and positive statements.

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Correlations between Self-Report and Thought Report Measures of Intrusive Thoughts

Given that participants' self-reports of the amount of time they spent thinking about the SCT feedback did not always yield the same results as did actual direct mentions of the feedback in the thought reports, I examined the relationships between these two variables, and explored whether these relationships varied according to experimental group. During mental control manipulation, self-report and direct mentions of the SCT feedback were significantly positively correlated across groups, $r(75) = .59$, $p < .01$, suggesting that there was a significant overlap between self-report and thought report measures of intrusive thinking during mental control. Looking at this relationship within each experimental group, I found that the suppression, concentration, and control groups each had significant positive correlations between self-report and thought report measures of intrusive thinking (r's $= .6 - .77$, p's $< .01$), whereas the expression group was nonsignificant ($r < .1$). Thus, with the exception of the expression condition, during mental control there appeared to be a reasonable degree of correspondence between participants' perceptions of their performance and the actual occurrences of intrusive thoughts in the thought reports.

For measures of intrusive thinking following release from mental control, there was again a significant positive correlation between self-report and thought report measures across groups, $r(76) = .3$, $p < .01$. However, this effect appeared to be carried by the suppression group, in which there was a significant positive correlation between measures, $r(19) = .62$, $p < .01$, whereas there were no significant correlations between self-report and thought report measures of intrusive thinking for any of the other groups (r's $< .27$). Therefore, with the exception of the suppression group, there appeared to be

less correspondence between self-report and thought report measures of intrusive

thinking following release from mental control instructions.

Chapter V: Discussion

Summary of Results

The primary aims of this study were first to determine if suppression plays a causal role in the development of depression-relevant intrusive thoughts and affect, and second to see if either expression of unwanted thoughts or concentration on desirable thoughts could prevent intrusive thinking and additionally improve affect. The design of the present study addressed these goals through the direct comparison of three manipulated mental control strategies (suppression, concentration, and expression) and a control group. Participants' thought content and affect were assessed both during and following mental control to determine the impact of these strategies on the occurrence of intrusive thoughts about unfavorable social feedback, plus the self-report and expression of positive and negative affect.

The results of the present study partially confirmed expectations that suppression would cause intrusive thoughts and depression-relevant affect. Participants in the suppression condition expressed more thoughts about the social competence test feedback following mental control than did those in the expression or control conditions. Thus, this was the first experiment to obtain a post-suppression rebound of personally-relevant intrusive thoughts in nondepressed individuals. Previous studies had only obtained a rebound of unwanted thoughts for neutral or emotional personally-irrelevant targets in the absence of current dysphoric mood or past depression symptoms. The results for self-reported thought content in this study did not corroborate the rebound of post-suppression intrusive thoughts in the thought reports, however. The suppression group did not self-report any more time thinking about the feedback following mental control than did any

of the other groups. In other words, the occurrence of actual mentions of the feedback showed rebound, but self-reports did not.

Contrary to predictions, suppression did not cause emotional rebound or increased distress relative to the other conditions following mental control. When compared to the expression of unwanted thoughts, focusing on positive thoughts, or simply reporting whatever is going through one's mind, the suppression of unwanted thoughts does not seem to increase negative affect or decrease positive affect. Despite the fact that suppression did not differ from the other strategies on most indices of affect, exploratory analyses revealed some interesting findings regarding suppression: Intrusive thoughts that occurred during suppression, but not those that occurred in the other mental control conditions, were associated with increases in negative affect during and following mental control. In addition, intrusive thoughts that occurred following release from suppression instructions were associated with concurrent decreases in positive affect. In other words, these relationships support previous findings that suppression creates a bond between thought and mood (Wenzlaff et al., 1991), that suppression-triggered intrusive thoughts can be distressing (e.g., Kelly & Kahn, 1994), and they provide further clarifications that post-suppression intrusive thoughts are associated with depressive affect.

The expected benefits of concentration and expression strategies for coping with reactions to the negative feedback were only partially supported. Although the findings for these strategies were not as robust as was hoped, they do provide some preliminary evidence that either expressing unwanted thoughts about a negative experience or alternatively refocusing attention on positive thoughts are effective strategies relative to the suppression of unwanted thoughts. Specifically, those who expressed their reactions

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to the negative feedback subsequently self-reported spending less time thinking about the feedback than did the control group, and made fewer direct mentions of the feedback following release from mental control instructions than did the suppression group. However, contrary to expectations, following mental control those who had earlier expressed their reactions did not appear to experience any positive changes in affect as measured by the valence of thought report statements, self-report, or observer ratings of affect. It appears, then, that expression may prevent the formation of preoccupations revolving around a negative experience, but may not have any immediate benefits for associated affect.

As predicted, those who were asked to focus on a memory of positive feedback expressed the most positive thoughts during mental control, relative to the other conditions, and they later reported more positive affect following the final think-aloud task than did those who had not been instructed to use mental control, and moderately more than those who had suppressed. Unlike expression, though, concentration did not significantly impact the occurrence of intrusive thoughts following mental control. Neither self-report ratings of thought content nor the number of mentions of the feedback differed from control. Thus, it seems that concentration was more effective for the control of affect associated with the negative experience than for the control of intrusive thinking.

The preceding summary reviews some of the highlights of the results from the present study. Confirming predictions, the rebound of personally-relevant thoughts demonstrated that suppression can create preoccupations with thoughts triggered by depression-relevant experiences. The findings also partially supported expectations that

expression of unwanted thoughts or concentration on positive thoughts would prevent the paradoxical effects of mental control from occurring after efforts to control unwanted thoughts and feelings have been given up. To further address the complexity of the study and the number of variables associated with my hypotheses, a more detailed examination of the results follows.

Suppression-related Effects

   Feedback thoughts during mental control. For the occurrence of intrusive thoughts during suppression, there was a contrast between self-reported time spent thinking about the SCT feedback and actual mentions of the feedback. As anticipated, participants who suppressed reported the least time thinking about the feedback; however, although there appeared to be a trend for suppressors to make fewer direct mentions than the control condition during mental control, this trend was not significant. In other words, suppression did not effectively prevent the occurrence of intrusive thoughts. These results may be consistent with other findings suggesting that suppressors generally believe they are more successful at controlling unwanted thoughts than they actually are (e.g., Wenzlaff & Bates, 1998), or that they may be exhibiting presentational biases against reporting intrusions (Wegner & Smart, 1997).

   Although there may have been a tendency for suppressors to self-report fewer experiences of thought intrusions than they expressed, the moderately strong correlation between self-reported intrusions and direct mentions of the test feedback in the thought reports provides some evidence that these two measures were capturing a fairly similar amount of the intrusive thinking that suppressors were able to perceive and report. This relationship between self-reported thought content and expressed thought intrusions may

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reflect the operation of a monitoring process that keeps the mind sensitive to unwanted

thought content. The monitor may have created a heightened awareness of unwanted test

feedback intrusions, which may have later increased the accuracy of participants'

recollections of how much they had thought about the feedback.

Affect during mental control. Suppression did not appear to impact the expression

of positive or negative affect during stream-of-consciousness reporting while under

mental control instructions, a result that is consistent with my predictions and past

research findings (e.g., Wenzlaff et al., 1988, Exp. 1). In the absence of depressive

symptoms or concurrent mood manipulations suppression should not impact affect during

mental control because paradoxical effects on mood are generally only observed during

cognitive load or in post-suppression rebound. However, as was earlier reported, an

interesting, but unpredicted, relationship was found between direct mentions and the

expression of affect during mental control. The tendency to make more direct references

to the test feedback during suppression was associated with the expression of more

negatively-valenced statements and with more negative observer ratings of global

affective valence. This pattern of relationships did not occur in any of the other

conditions. Unfortunately, there is not enough evidence to determine if the intrusive

thoughts influenced affect. Intrusions of feedback thoughts during suppression might

have caused increased negative affect, or alternatively, negative affect may have been

derailing suppression attempts, thereby causing the intrusions. At a minimum, it does

appear that the observed relationship between mentions and affect could represent the

formation of associations between unwanted thoughts and distracters (i.e., mood) during

suppression that have been implicated in post-suppression thought and mood rebound (Wegner & Gold, 1995; Wenzlaff et al., 1991).

Feedback thoughts following mental control. As was predicted, the suppression group made more direct references to the test feedback following mental control than did the expression or control group. These findings contrast with previous research that has failed to obtain a post-suppression rebound of negative personally-relevant thoughts relative to either a "free-monitoring" control or expression strategy group (e.g., Kelly & Kahn, 1994; Roemer & Borkovec, 1994; Borton et al., 2005). The rebound obtained in the present study may demonstrate the benefits of using experimentally-induced intrusive thoughts as mental control targets, versus using the participant-supplied intrusive thoughts of previous studies. Experimental manipulation of thought content may have reduced individual variance and practice effects for controlling preexisting thoughts.

Contrary to the above findings, the suppression group's self-reported time thinking about the test feedback following the cessation of mental control efforts did not differ from the other groups. Thus, there appeared to be a continued trend for participants to self-report more success at suppression than may have actually occurred. However, as had occurred during mental control, there was a moderately strong positive correlation between self-reported intrusions and direct mentions of the test feedback in the thought reports. The suppression group was the only condition to demonstrate this relationship after mental control had ceased, possibly reflecting the lasting influence of an ironic monitoring process on the suppressors' thought processes after intentional suppression had been halted. The ironic monitor may have continued to keep the mind sensitive to occurrences of the test feedback thoughts, causing a heightened awareness of how often

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those thoughts were occurring. Such a heightened awareness may have aided self-reporting of the amount of time the suppression group spent thinking about the feedback.

Affect following mental control. Contrary to expectations, suppressors did not express less positive affect or more negative affect on the PANAS following the final think-aloud task than did the control group. There were, however, several theoretically interesting relationships observed between intrusions and affect. As was reported earlier, there was a positive correlation between direct mentions of the test feedback during suppression and the post-suppression expression of negative statements. In other words, intrusive thoughts that occurred during suppression were associated with more depressive thought content after suppression efforts halted. These findings compliment and expand upon those reported by Wenzlaff, Wegner, and Klein (1991, Exp. 2), in which they found a positive correlation between the mood state experienced following suppression and the number of "white bear" intrusions that had occurred during suppression and concurrent mood manipulation. They explained that this relationship was evidence of the bond that is formed between thought intrusions and mood during suppression, which can later result in a post-suppression resurgence of either the intrusions or mood when its associate is reinstated. Based upon the observed bond between thought and mood, it is possible that more significant mood manipulation than what occurred in the present study might have intensified this relationship and the rebound effect.

As was earlier noted, post-suppression intrusions of test feedback thoughts were negatively correlated with positive statements and self-reported positive affect following suppression. These relationships may be evidence of suppression's detrimental effects on mood. Several studies have reported increased distress following suppression (e.g.,

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Roemer & Borkovec, 1994; Kelly & Kahn, 1994); however, this study did not observe the increased levels of negative affect that would be associated with post-suppression distress. Instead, post-suppression intrusions appeared to be tied to reduced positive affect, which may be more consistent with symptoms of depression (cf. Watson & Tellegen, 1985). Although causality cannot be definitively determined in these relationships, it is possible that post-suppression intrusions may trigger negative self-evaluative processes. Such a conclusion would be consistent with other findings that suppression leads to reduced self-esteem (Borton, 2002; Borton et al., 2005)

Concentration-related Effects

   Feedback thoughts during mental control. Much like suppression, attempts to control thoughts about the test feedback by concentrating on a memory of positive feedback appeared to work imperfectly. Although the concentration group demonstrated a trend to self-report and express fewer thoughts about the feedback than the control condition, it still expressed more thoughts than had been predicted. It is difficult to compare these findings to other research because the only previous study to use pure focus-positive instructions was one conducted by Wenzlaff and Bates (2000), in which concentration was compared to suppression and a control condition on an information-processing task. The task offered a very restricted range of response options (negative or positive) in contrast to the broad range of thoughts that can be expressed during stream-of-consciousness reporting.

   These results may be more consistent with the findings from a recent study that used focused distraction, in which participants were asked to replace each occurrence of an unwanted negative thought with a predetermined positive thought (Borton, 2002). In

her study, Borton found that men who were asked to replace negative self-referent intrusions with thoughts about a positive self-characteristic actually experienced more intrusions of the unwanted thoughts than did men who had been asked to focus on the unwanted thoughts or who had been given no instructions. It is possible that in the present study, the instructions to focus on a positive memory may have actually been implemented more as focused distraction during suppression than as pure concentration on a positive thought. Thus, the positive memory may have been used only as a distracter thought when intrusions of the test feedback occurred, thereby unintentionally cueing additional intrusions.

Affect during mental control. Despite a lack of significant impact on the occurrence of thought intrusions, the concentration strategy did perform as expected on measures of affect. Participants in the concentration condition produced fewer negative statements during mental control than did the control group, and more positive statements and higher global affective valence ratings than any other group. It appears that although focusing on a memory of positive feedback did not effectively control thoughts about the negative feedback, it did manage to control the affect that would be related to the feedback, as well as produce greater positive affect than other conditions. Although the mental control literature lacks adequate evidence of such effects, there is ample evidence in cognitive therapy and the information processing literature to account for this observed influence of positive thoughts on affect (e.g., Velten, 1968; for a review, see Sacco & Beck, 1995).

Feedback thoughts following mental control. Concentration on a memory of positive feedback did not effectively control against intrusions of test feedback thoughts

following cessation of mental control. Actually, the concentration strategy demonstrated a trend of yielding more direct and indirect mentions of the test feedback following mental control than did control instructions, opposite the predicted direction. In other words, these results are more similar to post-suppression effects than post-expression effects. This again conflicts with the results from the Wenzlaff and Bates (2000) study, which used an information processing task that was a less ecologically valid measure and provided a more restricted range of responses. Thus, it appears likely that although concentration is useful for managing information processes (e.g., allocation of attention), focusing on positive thoughts may not be an entirely effective strategy for preventing actual intrusions of unwanted thoughts. Wegner (1994) did review some studies demonstrating similar ironic effects of concentration that occurred primarily during stress or cognitive load. He noted that in cases where concentration was inhibited to some extent, distracters from concentration efforts tended to become more accessible. Although the current study did not employ any cognitive load to inhibit mental control efforts, the negative SCT feedback may have presented a particularly potent distracter that overwhelmed efforts to concentrate on a positive feedback memory.

Affect following mental control. Despite the fact that concentration on a positive memory did not control against SCT feedback intrusions, it did have some positive impact on affect after mental control was relinquished. Participants in the concentration condition reported higher perceived positive affect at the end of the experiment than did those in the control condition, and marginally higher than those who had suppressed. Additionally, though not significant, group means for global affective valence and positive and negative statements appeared to be in the predicted directions of being more

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positive and less negative than the other groups. There is ample evidence in the information-processing and cognitive theory literature that supports the claim that focusing on favorable thoughts positively alters one's mood (see Sacco & Beck, 1995), and the current study now expands these findings to mental control research by providing some preliminary evidence that using positively-focused concentration to cope with a negative experience may cause short-term improvements of affect.

Expression-related Effects

       Feedback thoughts and affect during mental control. Participants in the expression condition expressed more thoughts about the test feedback during mental control than did those in other conditions. Thus, as a manipulation, the expression condition did appear to perform as instructed. Contrary to predictions, though, those asked to express thoughts about the negative SCT feedback neither expressed the most negative affect nor the least positive affect, relative to the other groups. This conflicts with the findings of Roemer and Borkovec (1994) that expression of thoughts about personally-relevant negative experiences increases the expression of negative statements during stream-of-consciousness reporting, relative to suppression of such thoughts or to the expression of thoughts about a neutral target. However, the inconsistencies between that study's findings and the current results may be more an issue of the source of the target thought. Roemer and Borkovec (1994) used personally generated target thoughts, whereas the current study used an experimenter imposed target. It is possible that personally generated unwanted thoughts are already part of a highly elaborated network of though and affect, which causes them to be more easily activated upon cue than would be recently imposed thoughts about feedback (Bower, 1981). In other words, activation

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of affect related to recent feedback may take longer than it would for self-generated

thoughts, and thus reduce the likelihood that expression of thoughts about recent negative

feedback would trigger negative affect.

Feedback thoughts and affect following mental control. As had been predicted,

participants in the expression condition reported thinking less about the SCT feedback

following mental control that did those in the control condition, and actual intrusions of

feedback thoughts were less than for those in the suppression condition. Particularly

when compared to suppression, expressing reactions to a negative experience proved to

be an effective prevention for intrusive thoughts following mental control, much as has

been reported in previous research comparing suppression to expression (e.g., Roemer &

Borkovec, 1994; Wegner & Gold, 1995). However, the expression group means on

measures of affect were not significantly different from other groups, and did not appear

to be consistently more positive or more negative than other groups. There was an

unpredicted positive relationship between post-expression intrusions and positive

statements. This positive correlation contrasts with the negative relationship found

between post-suppression intrusions and positive affect. It is possible that the positive

relationship between post-expression intrusions and positive affect may reflect a tendency

for nondepressed individuals to employ positive distracters for coping with the continued

presence of thoughts about the test feedback (see, Wenzlaff et al., 1988).

Affect in Thought Reports following Mental Control

Contrary to predictions, there were no differences found between groups on any

of the post-mental control thought report measures of affect. These results contribute to

the collection of mixed findings concerning the impact of mental control on affect. Some

researchers have found evidence that suppression impacts self-reported affect (e.g., Kelly & Kahn, 1994; Roemer & Borkovec, 1994), but none have reported any impact on affect expressed in verbal thought content following mental control. Wegner, Wenzlaff and Kozak (2004) measured the rebound of target thoughts in dreams and actually rated the emotional intensity and valence of reported dream content, but found no effects for suppression. Wenzlaff and associates (1991) found that suppression influences the valence of thought content during mental control, but unfortunately did not report any similar analyses performed following mental control. Thus, it remains unclear if coding for affect in thought reports is a sensitive enough measure. As the first researcher to explore the influence of mental control strategies on subsequent valence of thoughts, I was unable to find differences between strategies following mental control. However, the observed differences that occurred between groups on thought report measures of affect during mental control suggest that the valence of thought content is a variable that warrants further exploration.

Indirect Mentions of the Feedback.

Although I made no specific predictions about the occurrence of thoughts that would be indirectly and thematically related to the SCT feedback, I did explore the possibilities that the occurrence of feedback thoughts would stimulate the activation of other thought content related to social competence. However, no strategy-related effects emerged for thought content thematically related to the test feedback. But the present results make sense when viewed in light of similar results obtained by Roemer and Borkovec (1994) in a study comparing the effect of expressing or suppressing anxious, depressing, or neutral target thoughts. They reported no rebound of the unwanted

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thoughts for any of the conditions, but they did find that anxious targets produced more indirect mentions than did depressing or neutral targets during initial expression, whereas depressing targets produced the most direct mentions. They explained that there is a greater tendency to ruminate upon depressing thoughts, yielding more direct references to them, and a tendency to try to avoid experiencing threatening thoughts, leading to more indirect references. In the present study, the test feedback was designed to generate more depressive than anxious cognitions, and therefore fewer indirect mentions.

Methodological Issues and Limitations of Study

Sample Variables

Sample size. One primary limitation that may have reduced the power in the present study was the sample size. Having 18 to 20 participants in each of the four conditions may not have been sufficient to detect the effects of each strategy. This is a similar problem to one experienced by McNally and Ricciardi (1996) who partially attributed lack of post-suppression rebound to having only modest power in their study. In addition, Abramowitz, Tolin, and Street (2001) performed a meta-analysis of 44 experiments that measured post-suppression rebound, and reported that the rebound effect tended to be small to moderate in magnitude. It is possible that the present study had sufficient power to detect post-suppression rebound of test feedback thoughts, but not enough power to detect the potentially modest effects of the different strategies on affect.

Sex differences. A limitation to the generalizability of the present findings may be the differences I found between the performance of males and females on several measures. Female participants talked about social competence issues more than males, tended to express more negative statements, and placed greater importance on being

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socially competent. Although the ratio of three females to one male in the present study might have obscured any sex effects that could have occurred, some other researchers have found that sex moderates the effects of mental control strategies. For example, Borton (2002, Exp.1) found that women reported naturally using suppression more than men, and that their tendency to suppress was related to lower self-esteem. But in a second experiment comparing the effects of several mental control strategies on measures of intrusions, mood, and self-esteem, only men experienced a post-suppression worsening of mood and self-esteem. Borton suggested that female participants may have been more practiced at suppressing the personally-generated intrusive thoughts, so this strategy was temporarily effective for them during the study. Overall, mixed findings concerning the effects of sex on mental control suggest that sex is an important factor to consider in future studies.

Effects of self-esteem on study completion. Differences were also observed between those who did and did not complete the present study. Study noncompleters reported lower social self-esteem than did study completers. It is possible that participants with lower social self-esteem may have been intimidated by the concept of receiving feedback on a test of social competence. The loss of these participants may have resulted in a bias toward participants with higher social self-esteem, which could limit generalizability to the general population. However, the unanticipated benefit of obtaining a sample with higher self-esteem was the opportunity to demonstrate that the paradoxical effects of suppressing reactions to a negative social experience can occur despite having positively biased social self-esteem.

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Social self-esteem. Participants' social self-esteem ratings also affected their reactions to the feedback in ways that have implications for the interpretation of the present results. I found that social self-esteem and perceived importance of social competence were positively correlated and generally rated fairly high, meeting the criteria Dykman and associates (1995) recommended for describing someone as having a positive social competence self-schema. Thus, the slightly negative social feedback that participants received would be considered primarily schema-inconsistent for most participants. Consistent with theories on information-processing biases, I did find that higher schema ratings were associated with perceiving the feedback as less favorable and less accurate, which means that they generally rejected the feedback because it was inconsistent with their currently active positive self-construct (Rumelhart, 1984; Ingram, 1984b).

Of the three mental control strategies, the expression group may have demonstrated processing of the feedback in a manner most consistent with a currently active positive social self-schema. As was reported earlier, post-expression intrusive thoughts were associated with a higher number of positive statements and indirect references to social competence. These findings hint at underlying information-processing biases that led to positive schema-consistent effects only for the expression group. It is possible that consciously processing reactions to the feedback in the presence of a currently active positive social self-schema may have aided the production of positive distracters and possibly began a process of reframing the experience to be more consistent with their current self-concept (see, Sanitioso & Wlodarski, 2004). Evidence

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for this speculation is limited, but it would fit within the body of research on disclosure and the expressive writing paradigm (for a review, see Sloan & Marx, 2004).

Mental Control Target

My choice of using mildly negative personally-referent social feedback did create some limitations. One problem encountered was that participants generally rated the feedback as inaccurate. Drawing from the literature on personality feedback, their nonacceptance is not unexpected because people tend to reject negative personality interpretations (for a review, see Snyder, Shenkel, & Lowery, 1977). And, I did find that lower ratings of the feedback's favorability were associated with lower accuracy ratings. Therefore, it is possible that nonacceptance of the negative interpretations might have meant that the feedback did not serve as an effective target for measuring intrusive unwanted thoughts. If participants did not believe the feedback, they might not have considered it a negative social experience worth processing. However, Ingram (1984a) stated that acceptance of feedback with the belief in its accuracy may not be necessary to ensure deep processing because evaluations about the feedback may happen after initial processing has occurred. Much as in real life experiences, we might doubt the feedback we receive, but still find ourselves thinking about it when it runs contrary to our expectations and our self-concept (see, Sanitioso & Wlodarski, 2004).

Suppression Instructions

Several issues concerning how the suppression strategy was operationalized and measured may have impacted the results of this study. The main problem was that the suppression group did not report attempting to suppress with as much effort as the other groups reported attempting to perform as they had been instructed. As was noted

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previously, this difference may be a consequence of the suppression instructions to "try not to do" something requiring engagement in a much less explicit operation than was required of the other conditions who had received instructions either to talk about the feedback, talk about a positive memory, or talk about anything. However, the rebound of test feedback thoughts following suppression belie the suppression group's low ratings of effort, and rather suggest that suppression was adequately attempted.

Critics have raised the methodological issue that rebound observed after suppression may be less representative of the paradoxical effects of suppression than they are a result of the exhaustion of the target thought following expression or free-monitoring (for a review, see Wenzlaff & Wegner, 2000). This study challenges the suggestion that differences observed between groups following mental control are only a consequence of the greater number of thoughts reported by the control and expression groups during mental control. Following procedures used by Clark, Winton, and Thynn (1993), I statistically controlled for the number of direct mentions occurring during mental control, and was able to support their conclusions that the rebound effect observed following suppression is a direct result of the strategy and not a methodological artifact.

Measures of Mental Control

I chose to assess thought and affective experiences via several modes of measurement primarily for the purpose of balancing out each measure's relative strengths and weaknesses. And, the results did show that there were frequently discrepancies between what self-report and stream-of-consciousness ratings were able to detect, with a particular note that no one measure was able to provide a complete picture of how the different strategies impacted affect and thought content. For measures of affect, although

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only the PANAS was able to detect differences between groups after mental control had ceased, I did find that affect measured in the thought reports and by the PANAS was predictably interrelated. Thus, in this case the PANAS may have proven more sensitive to the subtle shifts in mood due to mental control manipulation, but it was apparently measuring the same constructs that the thought report ratings assessed.

On measures of thought intrusions, self-report and stream-of-consciousness measures of intrusions did not appear to be consistently related. The relationships between participants' mentions of the test feedback and their perceptions of how much they thought about the feedback did not appear to be consistent across groups. Such inconsistent relationships may help explain why suppression differed from expression and control on direct mentions of the test feedback following mental control, but not on self-reported thought content. For the purpose of comparing mental control strategies, self-report may not provided a consistently accurate reflection of participants' thought content. Nevertheless, since stream-of-consciousness reporting can not completely replicate the natural flow of thought, self-report may have allowed additional observation of internal experiences that were not expressed (Klinger, 1978; Pope, 1977).

Theoretical Implications

The results of this study have several theoretical implications, both for mental control and depression vulnerability. Mental control strategies were found to mediate cognitive and affective responses to mildly negative social feedback. In sum, suppression produced the expected intrusive thinking and associated mood, and the expression and concentration strategies not only avoided these consequences of mental control, but may have produced some additional beneficial effects on thought and affect. The different

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consequences of these mental control strategies may have some implications for understanding how depressive cognitions and affect are formed.

Suppression and "Ironic" Processes Theory

The paradoxical effects of suppression result from the interaction of two mental processes that are activated when someone sets a goal to change their current mental state. A controlled operating process performs a broad search of the environment and mental contents for distracters to help achieve the desired change, whereas an automatic monitoring process searches just below consciousness for evidence that the desired change has not occurred.

Association hypothesis. The interaction between the contextual search of the operating process and the frequent priming, or intrusiveness, of the monitored thoughts can create a bond between context and unwanted thoughts (Wegner & Gold, 1995). Due to suppression's heavy reliance upon context for distraction, this association occurs during suppression to a far greater extent than it does with other mental control strategies. Because of these strong associations, reexperiencing the context or target of suppression after suppression is halted should facilitate the activation of its associate.

The apparent though-mood bonds that formed during suppression, and post-suppression rebound of test feedback thoughts that occurred in this study provided some support for such an "association hypothesis." Intrusive thoughts did occur during suppression, and these thoughts were associated with more negative affect during mental control. Although no rebound of mood was observed concurrent with post-suppression cognitive rebound, intrusive thinking during suppression was associated with higher negative affect after suppression was halted. Such findings suggest that intrusions

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experienced during suppression occurred within a negatively-valenced context that may have later cued the recurrence of the intrusive thoughts. Concurrent emotional rebound may not have occurred because there was not sufficient negative mood manipulation prior to mental control to create a strong enough mood-thought bond for emotional rebound. In other words, the lack of significant negative affect during suppression meant no significant rebound of negative affect following suppression.

Accessibility hypothesis. The hypervigilant nature of the automatic monitoring process causes unwanted thought content to remain highly accessible even when it is not consciously active (Wegner & Gold, 1995). The monitoring process keeps unwanted thoughts accessible even after mental control efforts have halted. The consequence of this "ironic" type of cognitive activation is intrusive thoughts, which can have negative effects on emotion.

The present study demonstrated intrusive thinking both during and following suppression. While suppression was being attempted, suppressors experienced what has been described as occasional failures of mental control while they attempted to eliminate the unwanted feedback thoughts from their consciousness (Wegner & Smart, 1997). The intrusiveness of feedback thoughts may have also been intensified during suppression because of their personal relevance, which facilitates deeper processing and would have made them harder to control than less relevant or neutral thoughts (Edwards & Dickerson, 1987).

Post-suppression intrusive thoughts about the test feedback may be evidence of a continually active monitoring process that kept the unwanted thoughts hyperaccessible and ready to be thrust into consciousness even after conscious efforts to suppress them

had ceased. Interestingly, this cognitive rebound occurred despite the fact that the feedback was incongruent with most participants' self-concept and mood. According to Ingram (1984a), feedback incongruent with currently active self-networks should show evidence of less depth of processing. Deeper processing should result in stronger and more associations with other mental contents, incorporation of the new information into the existing self-concept, and greater impact on information-processing. Ingram (1984a) suggested that feedback-congruent mood needed to be primed to facilitate deeper processing. However, the present study demonstrated that schema-incongruent information can be deeply processed absent any significant mood-priming. Specifically, post-suppression intrusions are evidence of the deep cognitive activation that occurs for monitored thoughts regardless of their incongruence with currently active self-concepts.

Intrusion-related affect experienced during and following suppression appears to provide further evidence of the distressing nature of intrusive thoughts and the continual impact of deep cognitive activation caused by an ironic monitoring process. The association between intrusions and negative affect during suppression may have reflected some level of distress over the inability to control unwanted thoughts. Failure to control one's thoughts when someone has expectations for success may be startling and lead to negative self-evaluations (see, Kelly & Kahn, 1994; Wenzlaff & Wegner, 2000). In contrast to the intrusion-related distress that occurred during suppression, post-suppression intrusions were associated with reduced positive affect, an association that may reflect lower self-esteem and increased depressive mood when unwanted thoughts recur following suppression (see, Borton et al., 2005). This would support conclusions that mental control failure leads to negative self-evaluation (Kelly & Kahn, 1994).

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Concentration and "Ironic" Processes Theory

A concentration strategy involves focusing on achieving a desired mental state. To accomplish this change, the operating process searches for mental contents that are consistent with the desired change, whereas a monitoring process performs a broad search for anything besides such contents. The broad search by the monitor should reduce the likelihood of intrusive thoughts, and the targeted search by the operating process should reduce reliance upon context. Thus, a concentration strategy should not be as vulnerable as suppression to the paradoxical effects of mental control failure or rebound.

Intrusive thoughts. The inability of the concentration strategy to completely control intrusions of test feedback thoughts either during or following mental control may reflect the role of the monitoring process in concentration efforts. Even though the operating process was aided in its efforts by having the specific target of a positive feedback memory upon which to focus, the monitoring process would have included some instances of the unwanted test feedback thoughts amongst all of its search results. At a minimum, this would be expected to result in the occasional intrusion of test feedback thoughts. The extent to which the intrusions did occur in the present study may reflect the particular potency of the test feedback thoughts as distracters from concentration on the positive feedback memory. These results may demonstrate how the effectiveness of concentration as a coping strategy depends upon positive concentration targets that are more attention consuming that the monitored thoughts.

Concentration and affect. Concentration produced the predicted positive shift in affect during mental control, and following cessation of mental control efforts it produced improved affect when compared to those who had not undertaken any instructed mental

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control. Thus, during concentration the operating process was successful at filling the mind with contents that would contribute to a desired state of mind. Although the monitoring process did trigger some intrusions and associated worsening of affect during concentration, these associations did not subsequently cue post-concentration rebound of either mood or thoughts. In other words, bonding of mood and thought did not occur during concentration to the same extent that it did during suppression. These results support mental control theory predictions that the lack of associations between monitored thoughts and context (i.e., negative mood) should mean that any intrusions occurring after an approach strategy is halted are not likely to automatically trigger negative affect.

Expression and "Ironic" Processes Theory

The expression of reactions to the social competence feedback had predicted effects on the occurrence of intrusive thoughts. Participants expressed a lot of feedback-related thoughts during expression, but later experienced only a negligible amount of intrusions. Consistent with accessibility and association hypotheses, expression of reactions to the social feedback kept the unwanted thought content conscious, thereby avoiding the consequences of deep cognitive activation. These consequences would have been the bonding of thought and mood, continued accessibility of unwanted thoughts following expression, and intrusion-associated distress following mental control (Wenzlaff, Wegner, & Klein, 1991; Wegner & Gold, 1995).

Expression as a mental control strategy in and of itself has not received sufficient coverage in the mental control literature. Particularly not addressed has been what it means for the state-selection process and how the processes of change are implemented. As Wegner and Wenzlaff (1996) have noted, it is not just important what change is

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desired but how that task is being accomplished. Expression may be implemented as a compound strategy combining an approach strategy with interpretive strategies that depend upon the activation of relevant schema contents to aid the processing of a given experience. In support of such a formulation of the expression strategy, the few intrusions that occurred following expression in this study were associated with positive affect. Consistent with research suggesting that nondepressed individuals possess a self-enhancing bias (cf. Wenzlaff & Bates, 1998) or the motivation to see themselves positively (Sanitioso & Wlodarski, 2004), the participants in this study may have been countering their intrusive thoughts with positive ones to support a positive self-image. Additionally, because a positive social competence schema was currently active, they had a rich supply of relevant positive distracters to choose from (see, Wenzlaff, Wegner, & Roper, 1988).

Depression Vulnerability

The greatest application of this study would be toward gaining a better understanding of the role of mental control in depression vulnerability. Much of the relevant research has shown that suppression can mask a cognitive vulnerability to depression, and that the tendency to suppress can promote negative thinking and later depressive symptoms (e.g., Wenzlaff & Bates, 1998; Rude et al., 2002). Research has also shown that a positive concentration focus can prevent the rebound of negative thinking (Wenzlaff & Bates, 2000), and that expression in the form of written disclosure can lead to positive cognitive and emotional changes (for a review, see Sloan & Marx, 2004). Thus, the paradoxical effects of suppression and the potential benefits of alternate strategies have been demonstrated to a degree. However, this study was the first to

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explore the role that mental control can play in the formation of depressive cognitions and the types of mood-thought associations proposed to exist in a depressive schema.

Suppression and depression vulnerability. As earlier noted, suppressors in this study experienced post-suppression intrusive thoughts and an associated decline in positive affect. These results may have greater relevance to the study of depression vulnerability than do similar results obtained in previous studies that used more neutral or personally-nonrelevant targets for mental control (see, Purdon, 1999). The targeted thoughts in this study were the reactions to negative social feedback, which was intended to be analogous to a type of situation to which someone possessing a diathesis for depression might negatively react (cf. Sacco & Beck, 1995; Fairbrother & Moretti, 1998). According to Beck (1976) such reactions would be evident of a latent depressive self-schema being activated by an event relevant to someone's specific vulnerability. However, post-suppression effects on intrusive thoughts and affect showed that some cognitive and affective depressive symptoms can be experienced following such an experience even absent a preexisting vulnerability. More amazingly, post-suppression intrusive thoughts and intrusion-related affect occurred despite participants' currently active positively-biased social self-schemata.

At this time it may be possible to speculate about how suppression and negative experiences may interact and contribute to the eventual formation of a depressive self-schema. Correlational and retrospective studies of childhood experiences have shown that avoidant coping is associated with depressive mood (cf. Wenzlaff & Eisenberg, 1998), and have suggested that suppression may actually contribute to the creation of emotional problems. Wenzlaff and Eisenberg (1998) further proposed that stress-induced intrusive

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thinking and associated emotional problems should be more likely to occur in children

who frequently cope with problems by suppressing their thoughts about them. Related

outcomes were observed in the present study and other research using college students

(e.g., Wenzlaff & Bates, 2000).

If one conceives of depression vulnerability as the result of early negative

experiences that formed a highly elaborated network of depressive mood and memory

associations revolving around themes such as failure or rejection (see, Bower, 1981;

Segal, 1988; Sacco & Beck, 1995), then one can begin to explore the influence of mental

control on the formation of such a depressive network. Concerning the common self-

denigrating themes of depressive schemata, suppression-induced intrusive thinking has

been found to promote negative self-evaluation and mood (e.g., Kelly & Kahn, 1994;

Borton et al., 2005). Concerning the formation of negative mood-thought associations

and information processes, the "ironic" cognitive activation of unwanted thoughts that

occurs via suppression facilitates deeper processing of information and stronger

associations between thoughts and affect related to a given experience (e.g., Wegner &

Gold, 1995; Wegner & Smart, 1997). Information that is deeply processed is more likely

to get incorporated into someone's self-concept and later influence the processing of

similar experiences (Ingram, 1984a). Later biased information-processing is facilitated

because of the strong mood-thought associations that are created by the frequent priming

of unwanted thoughts caused by the automatic monitor during suppression (e.g.,

Wenzlaff, Wegner & Klein, 1991; see also Segal, 1988). In essence, the stronger

associations between depressive thoughts and affect that result from suppression mean

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that the associated constructs are more accessible and able to affect other cognitive processes (Ingram, 1984a).

Wenzlaff and Wegner (2000) have expressed uncertainty about the long-term effects of thought suppression, primarily due to a lack of knowledge about when the automatic ironic monitor ceases its search and no longer sensitizes the mind to cues related to the unwanted mental contents. Some evidence suggests that, regardless of when the monitor ceases its search, frequently primed constructs tend to remain active longer then less frequently primed constructs (Bower, 1981; Higgins, Bargh, & Lombardi, 1985; Higgins, 1989). Thus, because of the monitor's frequent priming of unwanted mental contents, the effects of suppression may linger long after mental control intentions are forgotten. In the case of depression vulnerability, the lingering long-term effects of chronic suppression may be the development of a depressive self-schema. Unfortunately, lacking long-term research on chronic suppressors who do not possess a preexisting depressive self schema, at present it is only possible to speculate that chronic suppression causes depression vulnerability.

Alternate strategies and depression vulnerability. Although expressing reactions to the social competence feedback or concentrating on a memory of positive feedback were only mildly effective for altering thought content or momentary affect, both strategies may be effective for preventing the paradoxical effects of suppression. Perhaps the most important observation is that neither strategy resulted in the formation of a bond between intrusive thoughts during mental control and depressive affect, such as occurred during and following suppression. The lack of strong thought-affect associations means that in the long-run those constructs are not as likely to reactivate each other and trigger

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cycling between intrusive thoughts, affect, and recurrent mental control efforts. Thus, expression and concentration strategies are less likely than suppression to contribute to the formation of a depressive self-schema or onset of depression.

Concentration. Concentration on positive thoughts, in specific, may additionally aid coping with negative experiences by accessing positive mood-thought networks. This is likely to increase access to positive distracters and additionally inhibit access to negative though-mood associations. Therefore, positive concentration may ameliorate some of the negative emotional consequences of a negative experience. On the other hand, concentration may be ineffective if the availability of positive distracters is not sufficient to overcome the negativity of a current experience. Such might be the case if an experience is particularly traumatic, or if someone's positive self-concept is rather tenuous. Focusing on positive distracters may also prevent adequate processing of a negative event (see, Sloan & Marx, 2004). For instance, thought intrusions experienced during concentration in this study may have reflected the mind's attempts to redirect focus to the present experience. Thus, the monitor's role may have been to facilitate cognitive and emotional processing, rather than avoidance through focused distraction. It is unclear, though, what the long-term effects of positive focus would be, and whether the monitor would continue to reactivate thoughts about the experience.

Expression. Pennebaker (1997) has suggested that the conscious processing of a negative event that occurs during disclosure allows for the assimilation of the experience into one's self-construct. The result is reduced intrusive thinking and emotional consequences of suppression. Klein and Boals (2001) have further proposed that the expression and processing of an experience may help to free up working memory,

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primarily because expression reduces intrusive thinking, thereby increasing conscious capacity to dedicate to other tasks. Thus, expressing reactions to a negative experience may reduce the associated stress effects and increase cognitive resources for coping with the event. However, effective processing may be dependent upon what self-networks are accessible at the time expression is attempted. The results of this study suggested that positive schema-consistent processing was evident for those who expressed reactions about the event. In such a case where someone might have more negative mood-thought associations active, it is possible that expression could lead to worsening mood and possibly more ruminative thought processes (see, Nolen-Hoeksema, 1998).

Future Research Implications

The findings from this study offer only a preliminary view of the relevance of the interaction of mental control strategies and negative personal events to depression vulnerability. Further research is needed using more powerful designs to confirm the present results and provide more definitive proof that suppression of reactions to negative experiences can cause depressive symptoms, and that chronic suppression of such experiences may culminate in the formation of a depressive self-schema. Additionally, the findings that expression and concentration offer some advantages over suppression were not very robust, and need replication and expansion to allow stronger conclusions about their therapeutic and prophylactic value.

Experimental Design

A significant challenge to the present study was the attempt to simulate a negative personal experience in such a manner that participants would perceive the experience as negative and believable at the same time. In attempting to make the feedback more

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believable, the study sacrificed mood manipulation by using mixed, mildly negative

feedback. Unfortunately, although the feedback was perceived as mildly negative, it still

was generally considered inaccurate. This is reflective of similar challenges experienced

in studies that incorporate negative feedback as a stimulus (see, Snyder, Shenkel, &

Lowery, 1977). To draw stronger conclusions about the role of suppression in the

etiology of depressive symptoms following negative events, future studies would need to

be able to simulate a negative event relevant to common depression themes, and also

have the simulation be believable.

A recent study that offers hope for simulating negative social experiences is an

experiment performed by Henriques and Leitenberg (2002), which used actual social

interactions and critiques as the source of bogus negative social feedback. The

investigators assembled participants in small groups, where group members were given a

short period of time to interact with each other, then rate each other on several scales of

attributes supposedly related to social skills. During sessions one week later, they

received printouts containing negative profiles of their social performance supposedly

based upon group members' ratings. They also received a survey containing a question

about deception in the study. Despite the negativity of the feedback they had received,

less than four percent of participants correctly identified the feedback as false. Thus, the

negative social event was generally believed and accepted.

Intrusive Thoughts

A review of the most recent research on intrusive thoughts and avoidance

strategies shows that the greatest focus has been on their roles in the creation and

maintenance of obsessions and trauma symptoms (see, Sloan & Marx, 2004; Wenzlaff,

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2005), possibly because intrusive thoughts are considered central to the associated disorders (e.g., OCD, PTSD). However, there is growing evidence that intrusive thoughts present a significant risk for depression, partially because of their source in suppression and the resultant cognitive deficits and emotional reactions associated with intrusive thinking (Wenzlaff, 2005). A few recent studies have provided evidence of effects that may be related to suppression-induced intrusive thoughts, including the exposure of negative thought processes during cognitive load (Rude et al., 2003), and post-suppression reductions in state self-esteem (Borton et al., 2005). The present results add to this growing evidence, but also point to the need for renewed research into the depressive intrusions themselves.

Mental Control Strategies

Some of the research on intrusive thoughts appears to be redirecting its focus toward the comparison of suppression to another manner of coping with intrusive thoughts that does not involve approach or avoidance strategies. Beevers and associates (1999) reviewed literature recommending a method of coping with intrusive thoughts that involves nonjudgmental acceptance of the thoughts, rather than attempts to change them. Such therapeutic methods have recently been applied to clinical problems such as pain management and depression relapse prevention (cf., Beevers et al., 1999). One recent study has directly compared thought suppression to an acceptance-based technique for managing self-generated intrusive thoughts (Marcks & Woods, 2004). The researchers reported that suppression caused a post-suppression increase in relative distress, whereas acceptance produced a decrease in distress. However, there was no difference between groups in the frequency of intrusive thoughts following conclusion of the strategy

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manipulations. This study appears to have confirmed the present findings that suppression has paradoxical effects on affect, and additionally suggests that, like expression and positive concentration, nonjudgmental acceptance may prevent the formation of strong associations between intrusive thoughts and negative affect. Thus, it seems that any strategy that prevents cognitive avoidance may be relatively beneficial (see, Wenzlaff, 2005).

There appears to be merit in the continued exploration of acceptance-based coping strategies, particularly with an eye toward identifying the processes by which acceptance works (see, Beevers et al., 1999). However, the present findings suggest that examinations of the effects of expression and positively-focused concentration on intrusive thinking and emotional well-being should not be altogether abandoned. Because each of these strategies has their counterparts in a wide array of therapeutic techniques, further research expanding upon the results of the present study could have clinical significance for the treatment and prevention of depression. In particular, despite some observed trends for expression and concentration to perform differently on measures of thought content and affect, lacking significant evidence, these results are only open to speculation and cannot be translated into therapeutic practice.

Conclusions

The present study was the first to demonstrate a post-suppression rebound of personally-relevant intrusive thoughts. The results also demonstrated a decline in positive affect associated with cognitive rebound following suppression, but no such associations between thought and depressive affect for expression or positive concentration strategies. The observed effects provide further confirmation of the often reported counterintentional

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outcomes of attempting to avoid experiencing unwanted thoughts and feelings. And, they offer some preliminary evidence for the role of suppression in the formation of the types of preoccupations that could promote depressive affect.

The primary purpose of the current study was to identify the role of suppression in causing someone to become vulnerable to depression. The results did provide some insights into how someone can become preoccupied with relatively minor negative personal stressors, and how these preoccupations are associated with depressive affect. The stressor used in the present study is probably more analogous to minor stressors than to major traumas. This is relevant to understanding the etiology of depression because seemingly minor negative experiences might be expected to accumulate and eventually perpetuate depressive symptoms. The present findings cannot be directly generalized to understanding the role of suppression in coping with a major negative event; however, evidence from the literature on disclosure does suggest that suppression causes more negative cognitive and emotional outcomes following traumatic events (see, Sloan & Marx, 2004).

Because of the frequent comorbidity between depression and a variety of other mental and physical health issues, understanding the way someone typically processes their experiences may help identify those most at risk of developing a concurrent depressive disorder. By identifying individuals who tend to use suppression to cope with negative experiences, it may be possible to develop prophylactic treatment strategies to prevent the development or progression of depressive symptoms. By viewing suppression as a risk factor for depression, it becomes apparent that various techniques from cognitive-behavioral therapy, support groups, and other therapeutic modalities would be

readily adaptable to preventing the downward spiral into depression by those identified as at-risk because of chronic suppression, history of depression, or current mild depressive symptoms (see, Beevers et al., 1999; Purdon & Clark, 2005). Treatment that emphasizes skills training and development of social support can build positive self-esteem, as well as reduce perceived stress, which would expand cognitive resources for mental control. Increasing someone's perceived positive experiences may improve the availability and accessibility of positive thought-mood networks, which would benefit general emotional well-being and coping resources. Lastly, therapies that emphasize disclosure provide the opportunity for more rational processing of someone's unwanted thoughts, thereby helping to deflate the emotional and personal significance that tends to be assigned to intrusive thoughts. Overall, these and other effective treatment techniques share common themes of bolstering positively-focused concentration efforts, while allowing the processing of negative experiences, all toward the goal of preventing the paradoxical cognitive and emotional consequences of suppression.

Footnote

[1] Participants were randomly assigned to instruction conditions by drawing from a limited number (100) slips in an envelope that were evenly divided amongst the four conditions. To reduce the potential for random error produced by significant variance in BDI scores between groups, those who scored between 0 and 9 on the BDI and those who scored between 10 and 15 were treated as two separate groups for the purpose of assignment to experimental conditions. Therefore, they were drawn from separate envelopes to ensure an even distribution of nondepressed and mildly dysphoric individuals across the groups.

Table 1

Verbal Thought Report Instructions for the First and Second Think-Aloud Periods

Group	First Period	Second Period
A	Suppress thoughts about test feedback	"free-monitor" control
B	Concentrate on memory about previous favorable feedback	"free-monitor" control
C	Express thoughts about test feedback	"free-monitor" control
D	"free-monitor" control (report whatever comes to mind)	"free-monitor" control

Table 2

Presentation Order of Measures and Procedures

Session	Measure or Procedure
Group	Demographic questions, BDI, and WBSI
	Social Competence Test
	Social competence self-schema questions
Individual	BDI
	Descriptions of previous positive and negative feedback
	Practice think-aloud procedure
	Negative feedback on the Social Competence Test
	Questions about perceptions of feedback favorability
	PANAS
	First (manipulated) think-aloud procedure
	Questions about mental control effort and thought content
	Final think-aloud procedure
	Question about thought content in final thought report
	PANAS

Table 3

Kappa Statistics for Global Affective Valence Ratings of the Think-Aloud Transcripts

| Time | Mental Control Instructions | | | |
Period	Suppress	Concentrate	Express	Control
Time 1				
K	.32	.52	.37	.54
SE	.13	.13	.15	.13
Time 2				
K	.32	.67	.78	.64
SE	.17	.10	.09	.11

Note. Kappa coefficients are represented by the symbol *K*.

Table 4

Average Measure ICC's for Statement-Specific Affect and Direct and Indirect Mentions

of the SCT Feedback in the Think-Aloud Transcripts

	Mental Control Instructions			
Code Type/ Time Period	Suppress	Concentrate	Express	Control
Positive Affect				
1	.97	.95	.94	.87
2	.95	.97	.98	.97
Neutral Affect				
1	.98	.96	.98	.94
2	.98	.97	.99	.99
Negative Affect				
1	.90	.89	.95	.89
2	.95	.90	.95	.95
Direct Mention				
1	.97	1.0	.95	.98
2	.98	.97	.97	.96
Indirect Mention				
1	.94	.91	.94	.96
2	.92	.94	.83	.80

Note. All *p*'s < .01.

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Table 5

Mean Positive Affect and Negative Affect Schedule Scores immediately following Social Competence Test Feedback and at the End of the Experiment

Time Period	Mental Control Instructions			
	Suppress	Concentrate	Express	Control
Positive Affect				
Time 1				
M	25.78	26.68	27.06	24.65
SD	8.21	9.76	7.15	7.73
Time 2				
M	23.89	27.47 a	25.94	21.35 a
SD	8.96	10.35	11.06	8.99
Negative Affect				
Time 1				
M	14.95	14.94	15.78	14.35
SE	4.48	3.21	6.66	3.91
Time 2				
M	13.42	13.5	14.22	12.85
SE	4.21	3.65	5.8	2.64

Note. Means in the same row that do not share a subscript differ at $p > .05$.

Table 6

Mean Self-Report Ratings of Time Spent Thinking about the Social Competence Test

Feedback during the Think-Aloud Tasks

Time Period	Mental Control Instructions			
	Suppress	Concentrate	Express	Control
Time 1				
M	$1.94_{a^* d^*}$	2.53_{b^*}	$3.50_{a^* b^* c}$	2.80_{cd^*}
SD	.73	.77	.79	.89
Time 2				
M	1.89	1.84	1.67_{e^*}	2.25_{e^*}
SD	.81	.60	.97	1.02

Note. Means in the same row that do not share a subscript differ at *p* > .05.

$^*p < .01$.

Table 7

Mean Number of Direct and Indirect Mentions of the Social Competence Test Feedback during the Think-Aloud Tasks

Time Period	Mental Control Instructions			
	Suppress	Concentrate	Express	Control
Direct Mentions				
Time 1				
M	$2.89_a^{\ *}$	$2.45_b^{\ *}$	$13.89_{abc}^{\ *\ *}$	7.6_c
SD	3.1	4.82	9.08	7.01
Time 2				
M	2.79_{de}	1.5	$.58_d$	1.05_e
SD	3.68	2.92	1.1	1.72
Indirect Mentions				
Time 1				
M	8.71	13.74	14.08	14.5
SD	12.21	12.09	11.58	12.54
Time 2				
M	6.39	10.37	7.0	6.9
SD	6.83	9.23	7.02	5.38

Note. Means in the same row that do not share a subscript differ at $p > .05$.
[*] $p < .01$.

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Table 8

Mean Number of Positive and Negative Statements Expressed during the Think-Aloud

Tasks

Time Period	Mental Control Instructions			
	Suppress	Concentrate	Express	Control
Positive Statements				
Time 1				
M	8.63_a	$14.76_{ab}{}^*{}_c$	$6.33_b{}^*$	9.23_c
SD	5.73	7.66	5.1	5.12
Time 2				
M	7.16	10.24	8.28	8.13
SD	3.72	7.86	6.39	6.29
Negative Statements				
Time 1				
M	10.05	6.34_a	8.72	10.93_a
SD	5.26	4.25	5.46	5.78
Time 2				
M	9.37	8.24	8.97	11.65
SD	5.92	4.47	4.84	5.9

Note. Means in the same row that do not share a subscript differ at $p > .05$.
* $p < .01$.

Table 9

Mean Global Affective Valence Ratings for the Think-Aloud Tasks

Time Period	Mental Control Instructions			
	Suppress	Concentrate	Express	Control
Time 1				
M	$-.32_a^*$	$.82_{a\ b\ c}^{*\ *\ *}$	$-.53_b^*$	$-.38_c^*$
SD	.93	.90	.80	.74
Time 2				
M	-.16	.05	-.15	-.38
SD	.65	1.18	1.17	1.04

Note. Means in the same row that do not share a subscript differ at $p > .05$.

$^*p < .01$.

Table 10

Intercorrelations Between Self-Esteem and Social Competence Test Feedback Ratings

Rating Type		1	2	3	4	5	6	7
1.	Social Self-Esteem	-	.42**	.22	-.21	.15	-.29*	-.52**
2.	Importance of Social Competence		-	.23*	-.20	.29*	-.21	-.36**
3.	Post-Feedback Competency			-	.23	.82**	.25*	-.09
4.	Post-Feedback Favorability				-	.26*	.79**	.39**
5.	Experiment-End Competency					-	.35**	-.04
6.	Experiment-End Favorability						-	.40**
7.	Experiment-End Accuracy							-

Note. Ratings 1 and 2 refer to pre-feedback self-ratings of social competence and the importance of social competence to self-concept. Ratings 3 and 4 refer to participant perceptions of how socially competent the SCT feedback described them as being and how favorable was the feedback. Ratings 5 through 7 replicate ratings 3 and 4 at the end of the experiment, with the addition of a rating of how accurately participants thought the feedback described them.

* $p < .05$.

** $p < .01$.

Table 11

Pearson Correlations between Direct Mentions of the SCT Feedback made during Mental Control and Measures of Affect in Thought Reports during (Time 1) and following (Time 2) Mental Control

Direct Mentions during Mental Control	Thought Report Time Period	
	Positive Affect	
	Time 1	Time 2
Suppression	-.17	-.06
Concentration	-.37	.22
Expression	-.05	-.07
Control	.07	0
	Negative Affect	
	Time 1	Time 2
Suppression	.73**	.46*
Concentration	.42	-.01
Expression	.02	.28
Control	.14	-.11
	Global Affect Intensity	
	Time 1	Time 2
Suppression	-.46*	-.25
Concentration	-.69**	.14
Expression	.05	.06
Control	.09	.20

* $p < .05$.

** $p < .01$.

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Table 12

Pearson Correlations between Direct Mentions of the SCT Feedback made following Mental Control and Measures of Affect in Thought Reports following Mental Control

Direct Mentions following Mental Control	Affect following Mental Control
	Positive Affect
Suppression	-.49[*]
Concentration	.01
Expression	.49[*]
Control	-.07
	Negative Affect
Suppression	-.33
Concentration	.05
Expression	-.25
Control	-.29
	Global Affect Intensity
Suppression	-.17
Concentration	0
Expression	.29
Control	.16

[*] $p < .05$.

[**] $p < .01$.

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Figure 1. Mean positive affect (PA) and negative affect (NA) scores from the PANAS taken immediately following the Social Competence Test and at the end of the experiment.
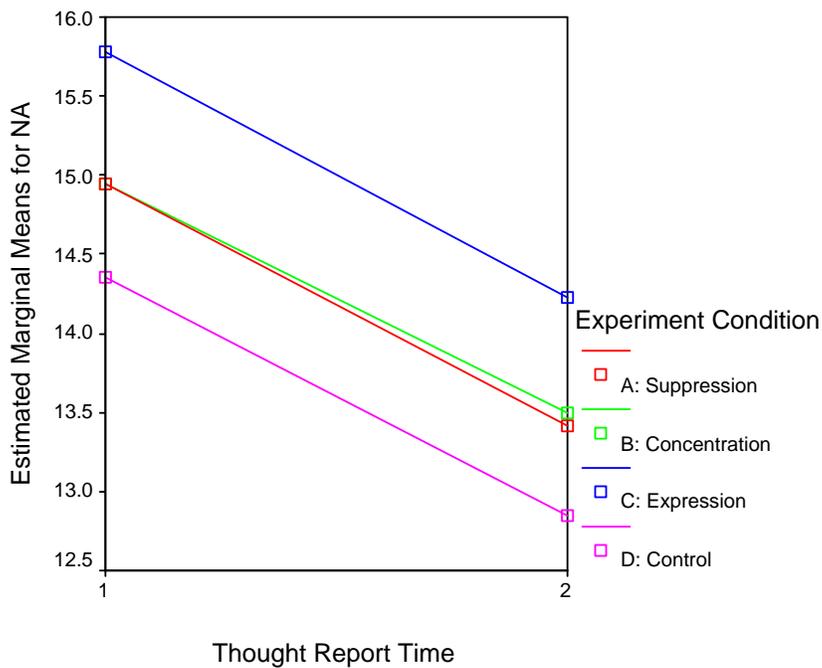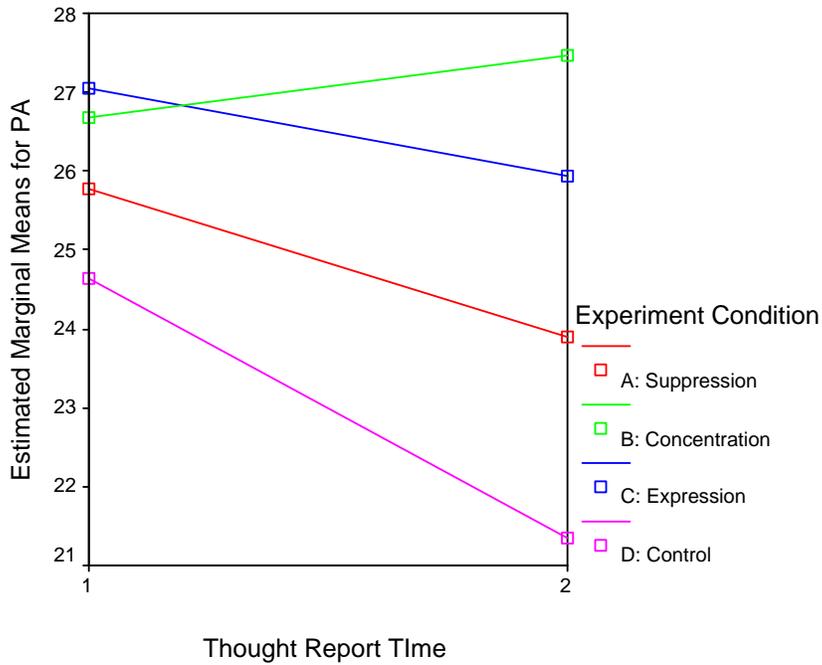
Figure 2. Mean self-report ratings of time spent thinking about the Social Competence Test feedback during the initial and final think-aloud tasks.
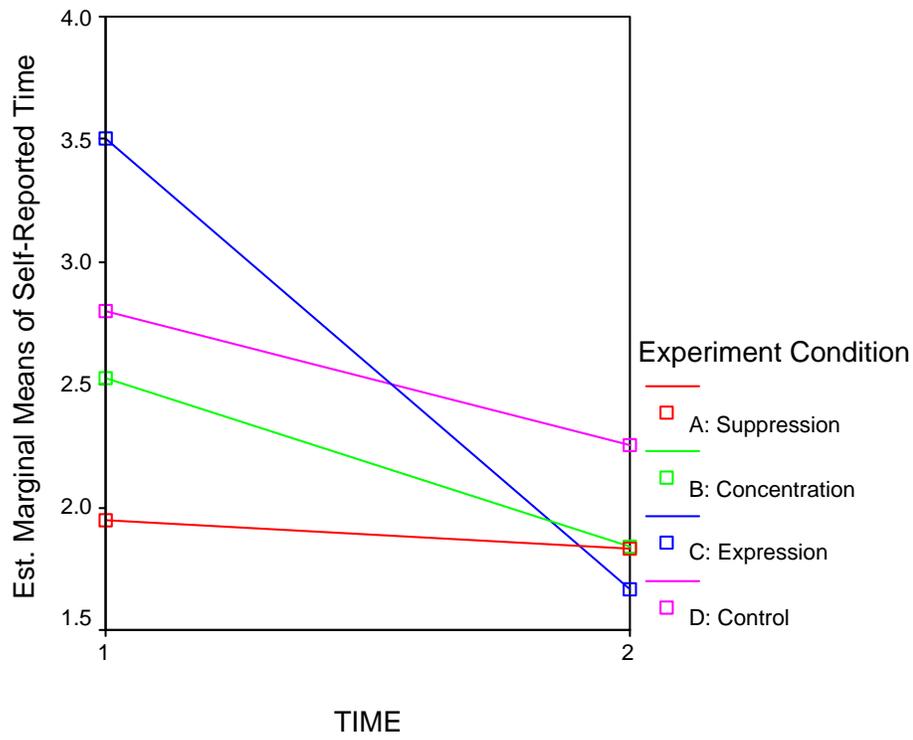
Figure 3. Mean number of direct and indirect mentions of the Social Competence Test feedback during the initial and final think-aloud tasks.
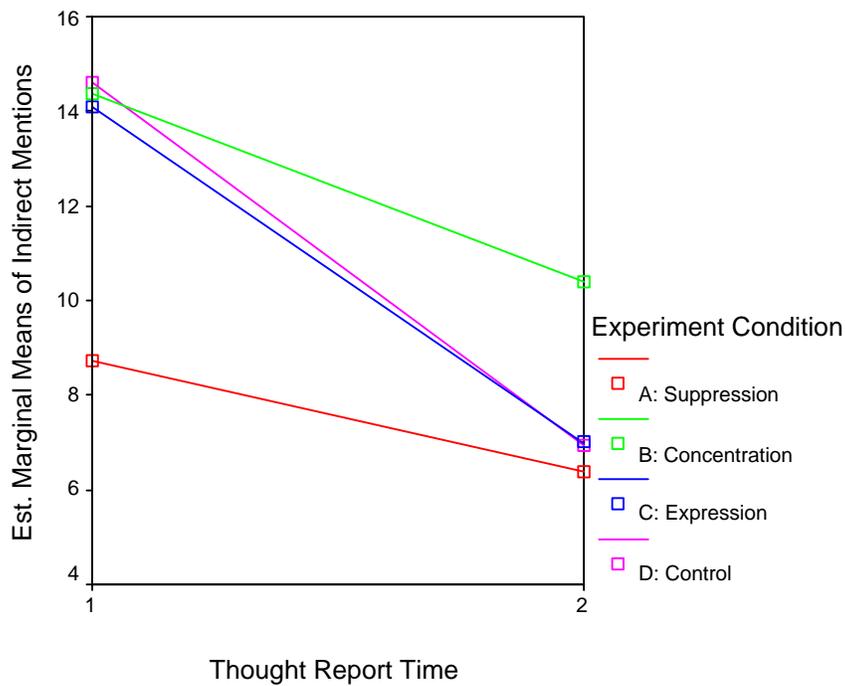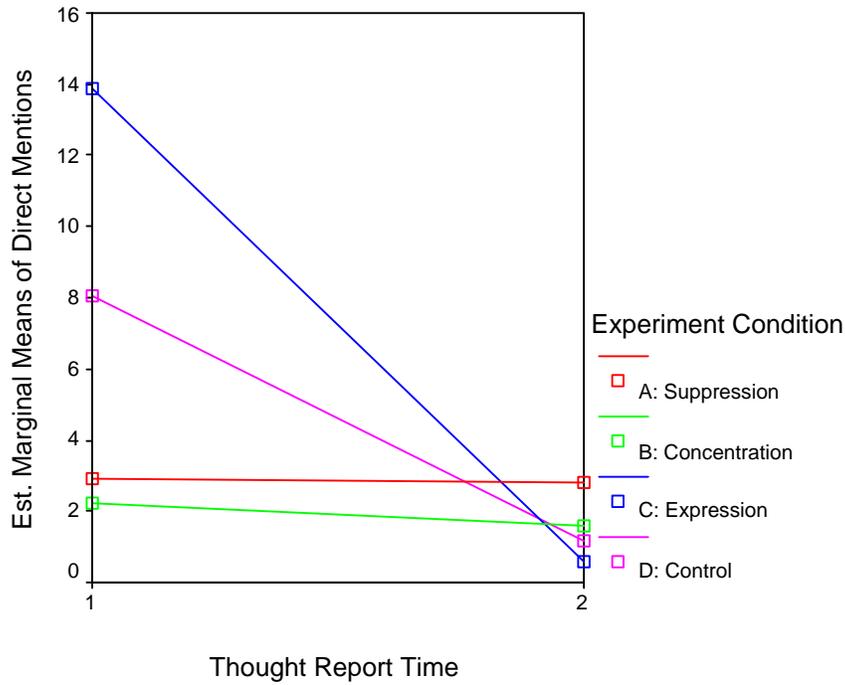
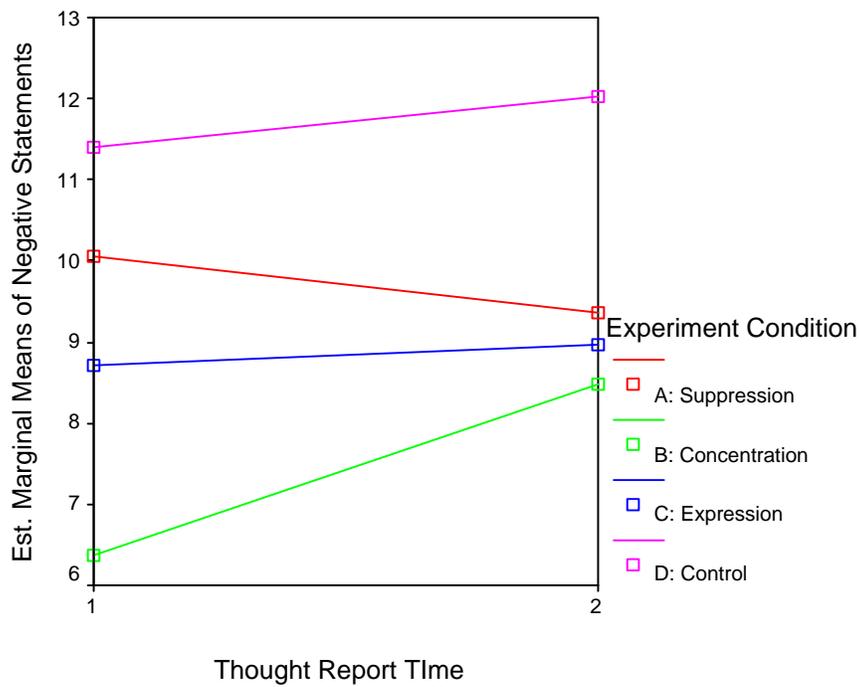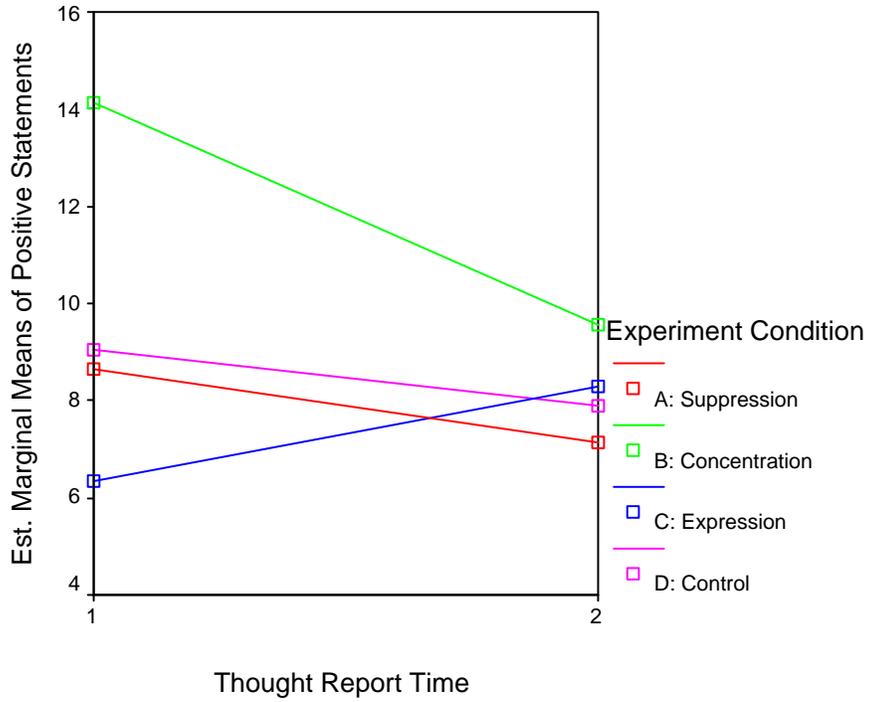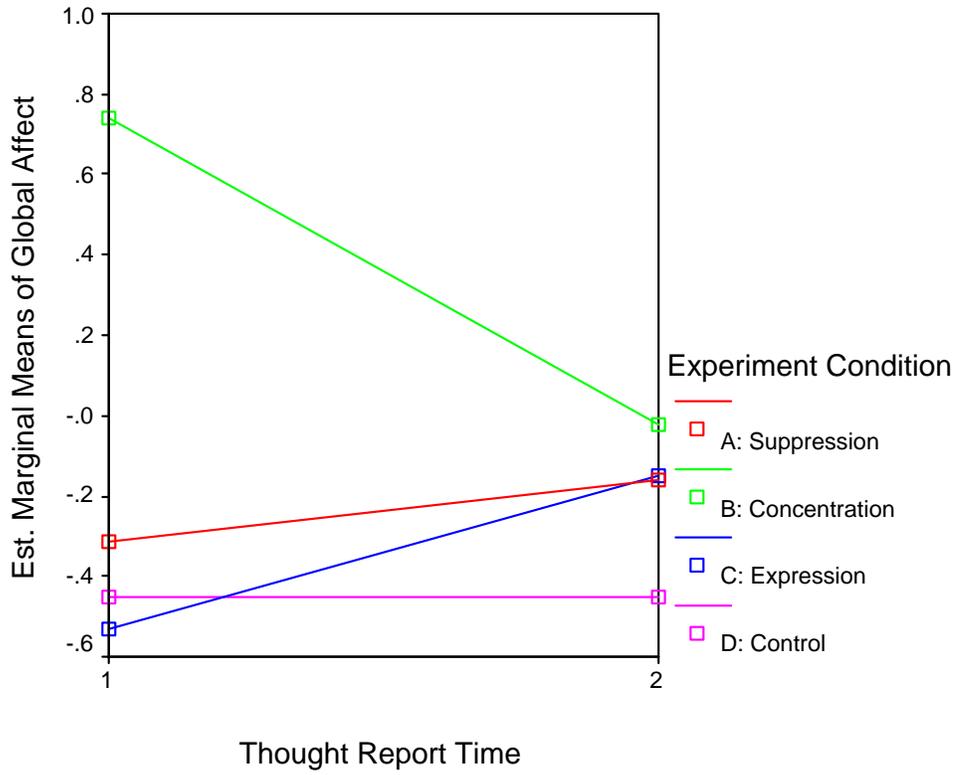*Figure 4*. Mean number of positive and negative statements expressed during the initial and final think-aloud tasks.

Figure 5. Mean global affective valence ratings for the initial and final think-aloud tasks.

Appendices

Appendix A

Informed Consent to Participate in Research

The University of Texas at Austin

You are being asked to participate in a research study. This form provides you with information about the study. The Principal Investigator (the person in charge of this research) or his/her representative will also describe this study to you and answer all of your questions. Please read the information below and ask questions about anything you don't understand before deciding whether or not to take part. Your participation is entirely voluntary and you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled.

Title of Research Study

Individual Differences in the Processing of Social Information

Principal Investigator(s) and Telephone Number(s)

Danielle Bates, B.A.   512-694-1035   d.bates@mail.utexas.edu
Stephanie Rude, Ph.D.   512-471-4409

Funding source:

Self-funded dissertation research project

What is the purpose of this study?

You have been assigned as part of your research participation requirements for the Educational Psychology subject pool, *OR* you have volunteered as part of you research participation requirements in the Psychology subject pool. You will be one of 120 participants in this study.
The purpose of this study is to assess people's social abilities and to explore the different ways that they perceive, process, and respond to social information.
What will be done if you take part in this research study?

The study requires approximately two hours of participation: One hour completing several measures in a group session, and one hour completing measures and tasks in an individual session with an experimenter about two - four weeks following the group session. You will complete measures assessing your mood, your thought content, and how you cope with information and various social situations. You will also describe some memories of past social experiences. Finally, during the individual session you will audiotape your thoughts and feelings several times.

What are the possible discomforts and risks?

It is possible you may find focusing on yourself and discussing your thoughts and feelings unpleasant. There may be additional risks that are unknown at this time. If you wish to discuss the information above or any other risks you may experience, you may ask questions now or call the Principal Investigator listed on the front page of this form. If you experience undue distress at any point during the study, you may withdraw at any time. Treatment will not be provided by any of the Principal Investigators or their associates; however, you may contact UT's Telephone Counseling Hotline (471-CALL) or the UT Counseling and Mental Health Center (471-3515).

What are the possible benefits to you or to others?

Beyond receiving two hours of credit toward your research participation requirements, it is possible that you may gain greater insight into yourself and your experiences. In addition, information gained from this study on the different ways people handle social experiences and information may help us understand more about what makes some people more vulnerable to various psychological and emotional disorders. This information may contribute to research on improving some forms of psychological treatment.

Will you receive compensation for your participation in this study?

There will be no monetary compensation for your participation.

What if you are injured because of the study?

There is no anticipated physical risk as a direct result of participation in this study; however, if injuries occur as a result of study activity, eligible University students may be treated at the usual level of care with the usual cost for services at the Student Health Center, but no payment can be provided in the event of a medical problem.

If you do not want to take part in this study, what other options are available to you?

Alternate assignments are available and are determined by the subject pool in which you are participating. Please, refer to your subject pool's research participation requirements.

Participation in this study is entirely voluntary. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with The University of Texas at Austin.

How can you withdraw from this research study?

If you wish to stop your participation in this research study for any reason, you should contact: <u>Danielle Bates</u> at (512)<u> 694-1035 </u>or <u>d.bates@mail.utexas.edu</u> . You are free to withdraw your consent and stop participation in this research study at any time without penalty or loss of benefits for which you may be entitled. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

In addition, if you have questions about your rights as a research participant, please contact Clarke A. Burnham, Ph.D., Chair, The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects, 512/232-4183.

How will your privacy and the confidentiality of your research records be protected?

Authorized persons from The University of Texas at Austin and the Institutional Review Board have the legal right to review your research records and will protect the confidentiality of those records to the extent permitted by law. If the research project is sponsored then the sponsors also have the legal right to review your research records. Otherwise, your research records will not be released without your consent unless required by law or a court order.

If the results of this research are published or presented at scientific meetings, your identity will not be disclosed.

Additionally, parts of your individual session will be audiotaped. The confidentiality of your audiotaped responses will be protected in the following ways: (1) The cassettes will be coded with your assigned identification number so that no personally identifying information is visible on them; (2) they will be kept in a filing cabinet in a locked office; (3) they will be heard or viewed only for research purposes by the investigator and his or her associates; and (4) they will be erased after they are transcribed or coded.

Will the researchers benefit from your participation in this *study*?

The principal investigator, Danielle Bates, will benefit by using this information to complete her dissertation as partial fulfillment of the requirements for the degree of Doctor of Philosophy in Counseling Psychology.

Signatures

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

_____   _____

Signature of person obtaining consent **Date**

You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this Form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

_____   _____

Signature of Subject **Date**

_____   _____

Signature of Principal Investigator **Date**

Appendix B

Demographic Questions from Cover of Group Administration Booklet

Age: _____

Sex: (circle one)   Male   Female

Ethnicity: _____

Is English your primary language?   _____Yes   _____ No

If you answered "No" to the above question, please describe your level of fluency in English by circling one of the following options:

A   I find it very difficult to communicate in English.
B   I find it sometimes difficult to communicate in English.
C   I communicate comfortably in English, but not as fluently as in my
       primary language.
D   I communicate at least as fluently in English as I do in my primary
       language.

Appendix C

The White Bear Suppression Inventory (Wegner & Zanakos, 1994)

This survey is about thoughts and emotions. There are no right or wrong answers, so please respond honestly to each of the items below. Don't work too fast, but don't spend too long on any one item either. Answer by circling letters to the left of each item as follows:

SD	D	N	A	SA
Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree

SD D N A SA   1.   There are things I prefer not to think about.
SD D N A SA   2.   Sometimes I wonder why I have the thoughts I do.
SD D N A SA   3.   I have thoughts that I cannot stop.
SD D N A SA   4.   There are images that come to my mind that I cannot erase.
SD D N A SA   5.   My thoughts frequently return to one idea.
SD D N A SA   6.   I wish I could stop thinking of certain things.
SD D N A SA   7.   Sometimes my mind races so fast I wish I could stop it.
SD D N A SA   8.   I always try to put problems out of mind.
SD D N A SA   9.   There are thoughts that keep jumping into my head.
SD D N A SA 10.   Sometimes I stay busy just to keep thoughts from intruding on my mind.
SD D N A SA 11.   There are things I try not to think about.
SD D N A SA 12.   Sometimes I really wish I could stop thinking.
SD D N A SA 13.   I often do things to distract myself from my thoughts.
SD D N A SA 14.   I have thoughts that I try to avoid.
SD D N A SA 15.   There are many thoughts that I have that I don't tell anyone.

Appendix D

Texas Social Behavior Inventory (Helmreich, Stapp, & Ervin, 1974; Helmreich & Stapp,

1974)

The Texas Social Behavior Inventory (TSBI) is designed to gather background and social behavior data. Below you will find a list of specific behaviors that you may or may not demonstrate. Please respond to each of these statements using the following rating scale.

A	B	C	D	E
Not at all characteristic of me.	*Not very*	*Slightly*	*Fairly*	*Very much characteristic of me.*

When you decide which letter is the best response for a particular question, place your answer on the blank line next to the question.

_____ 1. I am not likely to speak to people until they speak to me.

_____ 2. I would describe myself as self-confident.

_____ 3. I feel confident of my appearance.

_____ 4. I am a good mixer.

_____ 5. When in a group of people, I have trouble thinking of the right things to say.

_____ 6. When in a group of people, I usually do what the others want rather than make suggestions.

_____ 7. When I am in disagreement with other people, my opinion usually prevails.

_____ 8. I would describe myself as one who attempts to master situations.

_____ 9. Other people look up to me.

_____10. I enjoy social gatherings just to be with people.

_____11. I make a point of looking other people in the eye.

_____12. I cannot seem to get others to notice me.

_____13. I would rather not have very much responsibility for other people.

_____14. I feel comfortable being approached by someone in a position of authority.

_____15. I would describe myself as indecisive.

_____16. I have no doubts about my social competence.

_____17. I would describe myself as socially unskilled.

_____18. I frequently find it difficult to defend my point of view when confronted with the opinions of others.

_____19. I would be willing to describe myself as a pretty "strong" personality.

_____20. When I work on a committee (i.e., group project) I like to take charge of things.

_____21. I usually expect to succeed in the things I do.

_____22. I feel comfortable approaching someone in a position of authority over me.

_____23. I enjoy being around other people, and seek out social encounters frequently.

_____24. I feel confident of my social behavior.

_____25. I feel I can confidently approach and deal with anyone I meet.

_____26. I would describe myself as happy.

_____27. I enjoy being in front of large audiences.

_____28. When I meet a stranger, I often think that he/she is better than I am.

_____29. It is hard for me to start a conversation with strangers.

_____30. People seem naturally to turn to me when decisions have to be made.

_____31. I feel secure in social situations.

_____32. I like to exert my influence over other people.

Dating and Assertion Questionnaire. From "Toward the assessment of social competence," by R. W. Levenson and J. M. Gottman, 1978, *Journal of Consulting and Clinical Psychology, 18,* 453-462. Copyright © (1978) by the American Psychological Association. Reprinted with permission.

We are interested in finding out something about the likelihood of your acting in certain ways. Below you will find a list of specific behaviors you may or may not exhibit. Use the following rating scale:

1 = I never do this.   2 = I sometimes do this.   3 = I often do this.   4 = I do this almost always.

Now in response to each of the items on the following list, fill in the number that best indicates the likelihood of your behaving in that way. Be as objective as possible.

1. Stand up for your rights.

2. Maintain a long conversation with someone you find attractive.

3. Be confident in your ability to succeed in a situation in which you have to demonstrate your competence.

4. Say "no" when you feel like it.

5. Get a second date with someone you have dated once.

6. Assume a role of leadership.

7. Be able to accurately sense how a potential romantic interest feels about you.

8. Have an intimate emotional relationship with a romantic partner.

9. Have an intimate physical relationship with a romantic partner.

The following questions describe a variety of social situations that you might encounter. In each situation you may feel "put on the spot." Some situations may be familiar to you, and others may not. We'd like you to read each situation and **try to imagine yourself actually in the situation**. The more vividly you get a mental picture and place yourself into the situation, the better.

After each situation fill in one of the numbers from 1 to 5 that best describes you using the following scale:

> **1 = I would be so uncomfortable and so unable to handle this situation that I would avoid it if possible.**
> **2 = I would feel very uncomfortable and would have a lot of difficulty handling this situation.**
> **3 = I would feel somewhat uncomfortable and would have some difficulty in handling this situation.**
> **4 = I would feel fairly comfortable and would be able to handle this situation fairly well.**
> **5 = I would feel very comfortable and be able to handle this situation very well.**

1. You're waiting patiently in line at the checkout when a couple of people cut right in front of you. You feel really annoyed and want to tell them to wait their turn at the back of the line. One of them says, "Look, you don't mind do you? But, we're in a big hurry."

2. You have enjoyed this date and would like to see your date again. The evening is coming to an end, and you want to say something.

3. You are talking to a professor about dropping a class. You explain your situation, which you fabricate slightly for effect. Looking at his grade book the professor comments that you are pretty far behind. You go into greater detail about why you are behind and why you'd like to be allowed to withdraw from his class. He then says, "I'm sorry, but it is against university policy to let you withdraw this late in the semester."

4. You meet someone you don't know very well but are attracted to. You want to ask them out for a date.

5. You meet someone whom you find attractive and have a very enjoyable conversation. You'd like to get together again and decide to say something.

6. Your roommate has several obnoxious traits that really upset you. So far, you have mentioned them once or twice, but no noticeable changes have occurred. You still have 3 months to live together. You decide to say something.

7. You're with a small group of people who you don't know too well. Most of them are expressing a point of view that you disagree with. You'd like to state your opinion even if it means you'll probably be in the minority.

8. You go to a party where you don't know many people. Someone attractive approaches you and introduces him/herself. You want to start a conversation and get to know him/her.

9. You are trying to make an appointment with the dean. You are talking to his secretary face to face. She asks you what department you are in and when you tell her, she starts asking you questions about the nature of your problem. You inquire as to why she is asking all these questions, and she replies very snobbishly that she is the person who decides if your problem is important enough to warrant an appointment with the dean. You decide to say something.

Appendix F

Positive and Negative Affect Schedule. From "Development and validation of brief measures of positive and negative affect: The PANAS scales," by D. Watson, L. A. Clark, and A. Tellegen, 1988, *Journal of Personality and Social Psychology, 54,* 1063–1070. Copyright © 1988 by the American Psychological Association. Reprinted with permission.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

_____interested   _____irritable

_____distressed   _____alert

_____excited   _____ashamed

_____upset   _____inspired

_____strong   _____nervous

_____guilty   _____determined

_____scared   _____attentive

_____hostile   _____jittery

_____enthusiastic   _____active

_____proud   _____afraid

Appendix G

Transcript Coding Instructions

Coding the transcripts:

1. Each study participant had a subject #, and each participant recorded 3 thought reports. So, every new number/letter combo you see is a new transcript (e.g., 1a, 1b, 1c). Individual transcripts may be contained on one page or may take up several pages. The beginning of each new transcript is marked by its number/letter combo at the start of the paragraph. The same number/letter combo will be marked at the top of successive pages to denote the continuation of the same transcript.

2. Individual statements within a transcript are separated by a "/". A "/" may come at the end of a clearly marked sentence, or it may come at other points, such as following a ",". The purpose of the "/'s" are to identify what seem to be individual thoughts/statements that should be coded separately from other thoughts/statements. Each individual statement, which again will be whatever is between the "/'s", should be coded once for affect (type of emotion), and may also need to be coded for any direct/indirect mentions of the test the subject took during the study.

3. All transcripts will be coded for affect. Each statement should be coded as either reflecting a positive (+) thought, a neutral (0) thought, or a negative (-) thought. For each statement mark a +, 0, or – in the space anywhere below the statement. Tips on identifying positive, neutral, and negative thoughts will follow.

4. Only transcripts "b" and "c" for each subject will be coded for mentions of the Social Competence Test. **Direct mentions** are coded as "D", and include anything that directly refers to the Social Competency Test they took previously. Direct mentions may include referrals to "the test," "the/my feedback," or "the/my score/rank/rating," or any other statements that should clearly be referring to the Social Competency Test, not to any other exam or situation. These other "D" statements may include such things as ponderings about study results (if clearly meaning how the test results will be used), describing an emotional reaction to the test, discussing "its" impact on the subject, or reference to thinking or trying not to think about the test.
Indirect mentions are coded as "I", and include any of the following: References to situations that may involve issues of social competence, such as how well a person performs socially (I spoke well), the quality of their relationships and how they feel about others (He's my best friend, I love her), how they compare to others, concerns or statements related to self-presentation (I was nervous during my speech), self-consciousness (I must look stupid talking to this tape recorder), etc. Simply stating that a social situation or relationship exists is not sufficient to be considered an indirect mention (i.e., I gave a speech, I have a brother). Statements not directly/indirectly referring to the test are not coded.

5. Scoring for **global affect and emotional intensity** of the transcripts. The accumulated coded individual statements in a transcript may not always truly reflect our perceptions of how the person may have been feeling when they spoke those thoughts. For example, ironic or facetious statements (e.g., "Oh, no, I'm not angry about him wrecking my car!) will often be coded as positive or neutral, but are really expressing more negative emotions that won't be reflected in the coding. Therefore, each transcript will need an global affect rating based on the coder's sense or feel of the transcript (i.e. does it feel more negative/ more positive?). Use the following 5-point scale for rating each transcript:

-2   More negative

-1   Slightly more negative than positive

 0   Neutral or equally negative and positive

 1   Slightly more positive than negative

 2   More positive

Coding for Affect: Examples of positive, neutral, and negative thoughts.

The following are some suggestions about how to identify the type of affect/emotion expressed in a sentence/thought. There may be some situations that aren't covered by these coding suggestions, or that technically fit a particular coding suggestion, but don't really seem to reflect the suggested affect code (+, 0, -). Since coding is somewhat subjective, code such sentences according to you best judgment. For particularly long sentences (usually sentences containing "because" or "so that") code for the main feeling of the whole sentence. Generally you should treat each statement individually and take them at their face value. You can also review particularly ambiguous statements with me, and we can decide an affect code together.

Positive Affect (+)

Uses positive emotion or descriptive words (e.g., happy) that are not negated (e.g., not happy) in the statement. These can include positive adjectives (e.g., It is a wonderful day), verbs (I smiled/like/love), adverbs (I performed beautifully), etc.

Describes an event that is clearly positive to them.

"I hope…," "Hopefully…" when they clearly describe something they look forward to and/or are excited about. The statement should not be able to be alternatively interpreted as negative. For example, "I hope I do well this semester" could reflect interest in achievement (positive) or fear of failure (negative), so it would be coded as neutral. Most "I hope…," "Hopefully…" statements will be coded as neutral.

Statements such as "I'm looking forward to…" are clearly positive, but statements like "I can't wait to…." are more ambiguous and may often be coded as neutral. For all ambiguous statements, follow the same rule as applies for the "I hope…," "Hopefully…" statements.

A statement that expresses interest in something.

A statement of gratitude or relief like "Thank God it is Friday" or "I'm grateful that I finished all my papers on time."

Positive commentary on their own behavior.

Neutral/No Affect (0)

Usually a matter-of-fact statement, such as "I am going to do my homework tonight." These statements generally mention something that is or exists (e.g., my class is at 3:00), or something they have been doing (e.g., "We've been talking about…"), or something they haven't done (e.g., "I've never been to Mexico.") "I'm thinking about my grades" would be coded as neutral, even though the statement that follows it might express negative feelings (e.g., "I'm getting an F in Biology").

Any statement that could be considered emotionally ambiguous, in that its meaning could be interpreted as positive or neutral. General rule…if it isn't clearly positive or negative, score it as neutral.

Something they want to be or do that isn't clearly positive or negative (e.g., I want to become a lawyer). Again, the rule concerning "I hope…," "Hopefully…" statements applies. For example, "I want to do better this semester" could be read as + or -, so should be coded 0.

Sentences where the positive and negative halves cancel each other out. For example: "I'm glad I got an A on the test because I'm failing the class."

"I have to do…" as long as it is not clearly something negative/positive. "I have to register for classes" is neutral.

General commentary or a judgment expressed in a statement that is neither positive nor negative. For example, "This room is white" would be neutral, whereas "The light in here is just glaring" would be negative. Similarly, "it is hot in here" would be neutral (barely), whereas "it is too hot in here" would be negative.

There will be no feeling/emotion words in the statement (e.g., happy, bored).

Statements, such as "That is all I'm thinking about right now," "I can't think of anything else right now" are neutral.

Most questions are neutral. "Is it wrong to think that way?" Unless, they are clearly describing something negative. "Why do I feel so angry?" Or, positive. "How could I possibly feel any happier?"

"I'm wondering about…" and "I'm thinking about…." will usually be neutral. For example, "I'm wondering how I'm going to get to work on time" is neutral, whereas an alternate wording of "I'm worrying about how I'm going to get to work on time" would be negative.

"I don't know…" is usually neutral. "I don't know what I'll do this evening" is neutral, whereas "I don't know if I can take it any longer" would be negative.

Negative Affect (-)

Uses negative emotion or descriptive words (e.g., bored) that are not negated (e.g., not bored) in the statement. These can include negative adjectives (e.g., It is a terrible day), verbs (I blew up/hate), adverbs (I performed horribly), etc.

Saying something is "not good" or any similar negation of a positive adjective is negative because it expresses a negative sentiment. However, saying something is "not bad" would be neutral because it is not clearly a positive statement.

Describes a clearly negative event that would have a negative impact on them. "My boyfriend broke up with me." "My car broke down."

Expresses a clear desire/need to change a current unsatisfactory situation or resolve a current problem without expressing any clear optimism about an outcome. "Hopefully, I can get out of this mess."

Self-criticism.

Clearly expressed worry, concern, uncertainty (e.g., "I don't know what to do to fix this mess" or "How am I going to get out of this mess?").

"I'm feeling blah" is negative because "blah" is a negative emotion word.

Negative commentary on their behavior. (e.g., I shouldn't have done that….")

SCT

Social Competence Test
Performance Summary

Summary # __00235__

Sex: M   F

Individual performance record is printed below. An interpretive summary is provided below the performance record. For more detailed and item-by-item analysis, refer to the *Administration and Scoring Manual for the Social Competence Test (SCT)*. For tables of normed scores, refer to the *Technical Manual for the Social Competence Test (SCT)*.

	Score	Percentile*
Maximum Attainable	**140**	**99**th
Average for <u>College Student Population</u>	**115**	**75**th
Individual Performance	**89**	**55**th

*Percentile ranks appearing on this report reflect the percent of individuals performing below the given score for that percentile rank.

Summary Interpretation

Test-taker's performance on the Social Competence Test is <u>above average</u> for the general population. Test-taker's performance on the Social Competence Test is <u>below average</u> for a <u>college student population</u>.

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