An assessment of the Effectiveness of Positive Self-Talk on Engagement with Feared Stimuli and Control Related Beliefs

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ABSTRACT

AN ASSESSMENT OF THE EFFECTIVENESS OF POSITIVE SELF-TALK ON ENGAGEMENT WITH FEARED STIMULI AND CONTROL-RELATED BELIEFS

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Obsessive-compulsive disorder (OCD) is a disorder characterized by obsessions and compulsions that cause noticeable impairment across multiple life domains. Various mechanisms have been implicated in the development of OCD, including maladaptive control-related beliefs related to (1) individuals’ sense of control over any given situation and (2) trait motivation for desire of control. Specifically, low levels of perceived control and/or an elevated desire for control have been linked to obsessive-compulsive symptoms across a variety of OCD subtypes, including contamination concerns. The current gold-standard treatment for OCD is exposure and response prevention (ERP), which requires individuals to yield control and confront a feared stimulus while abstaining from completing compulsions to control distress. However, this treatment is only successful for approximately 50% of individuals who begin treatment. This statistic leaves room for improvement of ERP, particularly for clients with maladaptive control-related beliefs who have difficulty yielding control and engaging with treatment. Thus, one target for increasing ease of behavioral approach in exposure-based therapy for OCD may be the cognitive, control-based deficits underlying OCD symptoms.
Extant literature suggests successful yielding of control can be completed with a variety of techniques, one being positive self-talk. Research on the use of positive self-talk research in OCD is limited; however, a large literature base in the sports psychology literature has examined the benefits associated with using positive self-talk. The current study utilized findings from existing literature to develop a novel positive self-talk intervention in an effort to increase individuals’ engagement with feared situations. The study assessed the effect of the manipulation on participants’ ability to yield control and engage with feared stimuli in an adaptive way.

A sample of students (N = 81) with elevated contamination concerns completed a battery of questionnaires followed by either a positive self-talk intervention or a coloring activity and then a behavioral task with contamination-related stimuli. Results indicated the motivational positive self-talk intervention used was effective in assisting individuals with yielding control and increasing engagement with a feared situation. Specifically, participants who completed the active self-talk intervention (vs. control coloring condition) utilized positive self-talk more frequently, reported more confidence in their ability to use positive self-talk, and reported higher levels of motivation. Further, the active condition (vs. control) yielded significantly higher levels of cognitive and emotional control, but not overall sense of control. Lastly, when examining outcomes of the behavioral task, individuals who completed the active condition (vs. control) displayed significantly greater anxiety change, reported significantly greater confidence in their ability to approach feared situations, habituated more quickly (albeit non-significantly), and were two and a half times more likely to complete the second portion of the behavioral task. In sum, this study provided novel information regarding use of and benefits associated with positive self-
talk in an adult sample with elevated contamination concerns. Limitations, theoretical implications, and recommended future research directions are discussed.
AN ASSESSMENT OF THE EFFECTIVENESS OF POSITIVE SELF-TALK ON
ENGAGEMENT WITH FEARED STIMULI AND
CONTROL RELATED BELIEFS

BY

SARA L. CONLEY
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL
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CHAPTER 1
INTRODUCTION

Obsessive-Compulsive Disorder (OCD)

OCD is characterized by obsessions and/or compulsions. Obsessions are recurrent, intrusive thoughts, images, or impulses that are experienced as intrusive and cause anxiety or distress. They are concerns beyond worries about real-life issues that an individual realizes are irrational or a product of his/her own mind. Compulsions are repetitive thoughts or actions intended to attenuate the distress associated with obsessions. They are not done for pleasure and are often unrealistically related to the obsessional content or feared outcome (APA, 2013).

OCD is a severe mental disorder of significant public health concern. According to the World Health Organization, OCD is the 10th leading cause of disability and is the fourth most common psychiatric disorder in the USA (Fisher & Wells, 2008; Pigott, 1998), with a 12-month prevalence of 1.2% (APA, 2013). It is a chronic disorder that can decrease social functioning and quality of life significantly (Tenney, Denys, van Megen, Glas, & Westenberg, 2003), on par with functional impairment caused by schizophrenia (Bystritsky et al., 2001; Hollander, 2005). When compared to individuals suffering from other disorders (e.g., depression), individuals diagnosed with OCD are less likely to be married, more likely to be unemployed, and report higher levels of impairment in regard to social and occupational functioning (Torres et al., 2006). The disorder is under-diagnosed (Dell’Osso, Altamura, Mundo, Marazziti, & Hollander, 2007), and 50% of
those with OCD do not receive any treatment. Of those who do receive pharmacological and behavioral treatments, 40% do not respond (Kohn, Saxena, Levav, & Saraceno, 2004).

**Heterogeneity of OCD.** OCD is a heterogeneous disorder with varying symptom presentations and numerous possibilities for obsessional content and compulsive behaviors. Symptom patterns may be highly variable, allowing two individuals to receive a diagnosis of OCD based on distinct symptom presentations. Nevertheless, research (Abramowitz, Taylor, & McKay, 2007; McKay et al., 2004) indicates symptoms typically converge on five dimensions: (1) obsessions about being responsible for or failing to prevent harm, paired with checking compulsions and reassurance seeking; (2) symmetry obsessions paired with ordering and counting rituals; (3) contamination obsessions, paired with washing and cleaning rituals; (4) repugnant obsessions concerning sex, violence, or religion, often paired with thinking a “good” thought to replace the “bad” thought; and (5) hoarding obsessions paired with collecting compulsions.¹

The symptomatic heterogeneity of OCD can make research in this field challenging. As such, the current study focuses on one symptom dimension: contamination concerns. Contamination obsessions often are related to general uncleanliness, dirt, germs, or disease, whereas compulsions typically are related to washing or cleaning rituals (Rachman, 2004, 2006). This dimension of OCD was selected for logistical reasons. Namely, contamination-related OCD is one of the most common clinical presentations of OCD, with 30-50% of diagnosed individuals reporting a persistent fear of contamination (Calamari et al., 2004; Foa & Kozak, 1995; ¹Recent research supports the removal of hoarding as an OCD subtype, instead classifying it as a separate disorder.
Rasmussen & Eisen, 1992). It also is likely to be endorsed fairly commonly at subclinical levels by nonclinical samples. Additionally, the contamination symptom dimension allows for greater generalizability across participants because obsessions generally are similar (e.g., stimuli would be applicable to a wider range of participants because of relatively limited intradimensional heterogeneity) and existing contamination-based behavioral approach tasks used in OCD research have garnered the most empirical support in terms of sound psychometric properties (e.g., Najmi, Tobin, & Amir, 2012).

**Cognitive Models of OCD and Control-Based Beliefs**

Multiple contemporary models have focused on the beliefs and strategies involved in the etiology, maintenance, and exacerbation of OCD. Cognitive and cognitive-behavioral models of OCD have emphasized the role of dysfunctional beliefs and faulty appraisals as a critical cognitive component in the etiology and maintenance of the disorder (Clark, 2004; Rachman, 1997; Salkovskis 1985, 1989). Salkovskis’s model of OCD posits obsessional thinking originates from unwanted, intrusive thoughts, images, or impulses. Intrusive thoughts are experienced by most individuals in the general population (Gibbs, 1996) and often reflect important concerns or issues; however, the difference between a typical intrusive thought and an obsession is the manner in which the thought is interpreted or appraised. According to Salkovskis, individuals with OCD tend to attribute exaggerated significance to the intrusion or appraise it as highly important or as implying meaning about oneself. This appraisal results in increased intrusions
and distress which, in turn, shifts an individual’s focus onto the intrusion and anything relevant or triggering in the environment (Salkovskis, 1985, 1989).

Per Moulding and Kyrios (2006), maladaptive beliefs about control, including control beliefs related to the self (e.g., thoughts, emotions) and the world, result in the development of compulsive rituals. It is posited that compulsions develop in part as an effort to control the world, thoughts (i.e., obsessions), and concerns that emerge regarding the potential loss of control over an individual’s thoughts and/or actions (Carr, 1974; Moulding & Kyrios, 2006). Two broad, control-based constructs have been identified as highly relevant for OCD: sense of control and desire for control. *Sense of control*, also termed perceived control, refers to beliefs about control that are available in any given context (Skinner, 1996) and encompasses several constructs, including internal locus of control (e.g., Levenson, 1974) and self-efficacy (e.g., Bandura, 1997). *Desire for control*, also termed motivation for control, is viewed as a fundamental motivation exhibited by humans (Deci & Ryan, 2006; Doron & Kyrios, 2005) and is normally distributed within the population (Burger, 1992). Individuals who endorse a high desire for control prefer to avoid unpleasant events by manipulating situations to ensure desired outcomes.

The relationship between sense of control and desire for control has implications for anxiety and obsessive-compulsive (OC) and related disorders. Existing research indicates individuals with OCD endorse cognitions related to the need for control, particularly the need to control thoughts. These cognitions and related metacognitive constructs, or beliefs that absolute mental control over thoughts is both possible and desirable, have been identified as maintaining factors for OC symptoms (Clark, 2004). Further, research indicates individuals with OCD report a greater need for control than individuals diagnosed with other anxiety disorders (e.g.,
generalized anxiety disorder, GAD) or healthy controls (e.g., OCCWG, 2003; Taylor, Kyrios, Thordarson, Steketee, & Frost, 2002). This need for control is viewed as a dysfunctional response to vulnerability and distress associated with intrusive thoughts (Sookman, Pinard, & Beck, 2001) and when paired with a lower sense of control can exacerbate symptoms and motivate neutralizing behaviors. Neutralization behaviors, including compulsive rituals, have been shown to increase individuals’ sense of control temporarily but do not result in long-term benefits (Brown, White, Forsyth, & Barlow, 2004). In sum, OC symptoms have been found to be associated with low sense of control. Further, individuals who report higher levels of desire for control in conjunction with low levels of sense of control report more severe OC symptoms (Moulding & Kyrios, 2007). This control discrepancy may serve as a motivation for engagement in compulsive rituals to increase perceived control (Baron & Logan, 1993; Moulding & Kyrios, 2006).

Current Status of Existing Psychological Treatments for OCD

Effective pharmacological and cognitive-behavioral (CBT) treatments for OCD have been established (Gillihan, Williams, Malcoun, Yadin, & Foa, 2012). Current CBT treatments for OCD are based on normalizing intrusive thoughts and confronting feared situations. The psychosocial treatment with the most empirical support is a CBT treatment approach termed exposure and response (or ritual) prevention (ERP; Abramowitz, Taylor, & McKay, 2007; Franklin & Foa, 1998; Kozak & Foa, 1997). ERP involves confronting stimuli that evoke obsessional distress while resisting rituals aimed at alleviating or neutralizing distress. Exposures
are idiosyncratic in nature and can be performed in real life (in vivo) or performed in a client’s imagination (imaginal). By engaging repeatedly in ERP, individuals with OCD learn their feared outcomes do not occur when contacting feared stimuli, even when abstaining from rituals. As engagement with rituals decreases and successful exposure to feared stimuli increases, the urge to ritualize is weakened. Further, individuals are provided with corrective experiences about their fears and learn they are able to tolerate states of elevated distress (Abramowitz, Deacon, & Whiteside, 2011; Gillihan et al., 2012).

Studies have identified ERP to be the treatment of choice for OCD, finding it to be superior to cognitive therapy, pharmacotherapy, and wait-list or placebo conditions with respect to percentage of symptom reduction both immediately following treatment and at follow-up assessments (Abramowitz, 1997, 1998; Franklin & Foa, 2002; van Balkom et al., 1994). Further, effect sizes associated with change in OCD severity often are large both immediately following ERP and at follow-up (e.g., $d = 1.80$ to 2.12; Abramowitz, Franklin, & Foa, 2002). Meta-analyses have identified symptom reduction in 40-97% of clients, depending on the study (Abramowitz et al., 2002; Foa & Kozak, 1996). Some authors suggest the success rate of ERP largely is contingent on implementation methods, including frequency of treatment sessions, group versus individual format, and involvement of family members (Franklin & Foa, 2002). Research has shown frequency of ERP sessions to be positively associated with reduction in symptoms. When examining treatment modality, findings suggest symptom reduction occurs more quickly in individual treatment settings (vs. group); however, similar reductions in symptoms are found immediately following treatment regardless of treatment format or family involvement (Fals-Stewart, Marks, & Schafer, 1993; Franklin & Foa, 2002). Lastly, findings
suggest ERP results in statistically reliable improvement in approximately 75% of clients who complete treatment, with a recovery rate closer to 60% and rate of asymptomatic clients at 25%, which is better than improvement rates for cognitive therapy (Fisher & Wells, 2005).

Whereas significant symptom reduction may occur in a majority of clients in some studies, only approximately 50% of individuals who begin ERP will experience successful symptom reduction (Abramowitz et al., 2006; Ost et al., 2015). Moreover, it has been estimated that approximately 18-25% of individuals diagnosed with OCD will refuse to engage in ERP treatment (Franklin & Foa, 1998; Ong, Clyde, Bluett, Levin, & Twohig, 2016). Clients report a number of reasons for why they refuse treatment, including a preference to manage their OCD symptoms without help (Issakidis & Andrews, 2002), low motivation for treatment (Bados, Balaguer, & Saldaña, 2007), and apprehension about the difficulty and intensity of ERP treatment (Maltby & Tolin, 2003). Therefore, although ERP is highly successful for some clients, some refuse to engage and others are unable to achieve success via this approach.

In addition to yielding inconsistent response rates, ERP is not widely used by mental health practitioners who treat OCD (Mancebo et al., 2006), which can limit availability and success of treatment. This lack of use by some practitioners partially may be explained by negative beliefs held by mental health practitioners about exposure therapy, including that it is unethical, intolerable, or unsafe for clients (Deacon & Farrell, 2013). Research has shown negative beliefs about exposures lead to more cautious delivery of treatment, which could negatively impact the efficacy of treatment on symptom reduction (Farrell, Deacon, Dixon, & Lickel, 2013). Negative beliefs about ERP and lack of familiarity with the treatment can result in the occurrence of mistakes, including not encouraging clients to confront their most feared
situations, utilizing the imaginal exposures when in vivo would be more appropriate or vice versa, encouraging distraction, or providing reassurance (Gillihan et al., 2012).

When examining clients’ opinions about treatment, research suggests clients report exposure-based CBT to be acceptable and helpful (Deacon & Abramowitz, 2005), albeit less likeable than other treatment approaches (Cox, Fergus, & Swinson, 1994). One explanation for ERP’s acceptability is that clients who are accustomed to experiencing longstanding distress may be less intimidated to experience the temporary elevated distress associated with exposure therapy (Richard & Gloster, 2007), even though they may not enjoy experiencing the elevated distress. However, there are some clients who may be more resistant to engaging in feared situations and increased distress levels, even if the experience is temporary. One subset of clients who may have difficulty accepting and experiencing increased distress associated with ERP are those whose OC symptoms are exacerbated by elevated desire for control and/or low sense of control. Clients with these presentations may actively avoid experiencing distress; therefore, relinquishing control and experiencing heightened distress levels are viewed as highly aversive, resulting in lower adherence to treatment and increased likelihood of attrition (Moulding & Kyrios, 2006).

Supplementation of ERP to Enhance Ease of Exposure

Given the inconsistent response rates for exposure-based therapies throughout the anxiety and OCD literatures, researchers have attempted a number of approaches to supplement ERP in an effort to increase engagement and treatment response. These attempts at improving ERP have
met with mixed success. For example, ERP has been supplemented with motivational interviewing (MI) techniques (e.g., Maltby & Tolin, 2005; Simpson, Zuckoff, Rage, Franklin, & Foa, 2008), pharmacotherapy approaches (e.g., D-cyclocerine, [Kushner et al., 2007; Storch et al., 2010], methylene blue, [Tuerk, 2014]), computerized bias assessments (e.g., Amir, Kuckertz, Najmi, & Conley, 2015), skills training (Foa, Rothbaum, & Furr, 2003), stress inoculation training (Meichenbaum, 1985), and acceptance and commitment therapy (ACT; Twohig et al., 2015). Although some of these studies have found successful results, including increased treatment engagement and increased speed of symptom reduction (Simpson et al., 2008; Wilhelm et al., 2008), others have found results similar to or worse than standard ERP (Maltby & Tolin, 2005; Storch et al., 2010).

**Supplementing with motivational interventions.** The current study proposes the use of a novel motivational intervention; therefore, existing effects of supplementing ERP for OCD with MI are examined in depth. MI was developed to encourage motivation for commitment to change and to resolve any ambivalence associated with change (Miller & Rollnick, 2013). Meta-analyses indicated MI has resulted in successful change of a range of problem behaviors with moderate-to-large effect sizes, including effects up to $d = .77$ for behaviors such as treatment compliance (Randall & McNeil, 2016).

Studies in the clinical psychology literature have examined the effects of supplementing ERP for OCD with MI using various approaches. Some studies examined the effectiveness of having clients complete MI sessions prior to engaging with ERP (e.g., Maltby & Tolin, 2005), whereas others implemented a combination approach that included initial MI sessions followed
by the integration of MI with ERP. For example, Simpson and colleagues (2008) utilized MI strategies for three sessions prior to ERP treatment to help clients ($N = 6$) decide if ERP was a good fit and increase their commitment to change and treatment. Fifteen sessions of ERP followed the initial MI sessions, with MI principles and strategies used throughout in response to client resistance.

Results from the above-listed studies are largely positive, with multiple case studies suggesting MI helps clients to enroll in and engage with ERP (Simpson et al., 2008). Further, MI has shown to help clients persevere through exposures (Riccardi, Timpano, & Schmidt, 2010), particularly when they are “treatment refractory” (Simpson & Zuckoff, 2011). Although positive effects of MI have been identified, so have null effects. For example, Maltby and Tolin (2005) utilized a motivational intervention termed a “readiness intervention” (RI) for four weeks prior to ERP treatment with clients who had been identified as treatment refusing. This intervention resulted in the engagement of significantly more clients in ERP treatment when compared to a wait-list control group (86% vs. 20%). However, 50% of clients who began ERP following RI dropped out before completing treatment or experiencing significant symptom reduction, a percentage that exceeds rates typically seen in OCD studies (Maltby & Tolin, 2005). Further, Simpson and colleagues (2008) experienced a 33% dropout rate, which also is higher than the 25% reported across other studies (Franklin & Foa, 1998).

In sum, supplementing ERP with MI appears to increase clients’ willingness to engage in ERP initially; however, it does not appear to help maintain engagement throughout treatment beyond what is typical for ERP. Given the inconsistent findings of approaches used to supplement ERP in general, and with motivational interventions specifically, there still is room
for improvement of ERP, especially when it comes to further increasing acceptability and engagement for all clients.

**Supplementing for individuals with distorted control-related beliefs.** One group of individuals for whom acceptability and ease of exposure therapy can be increased is individuals with dysfunctional control-related beliefs. It has been suggested ERP may be more difficult for these individuals, and implications and future directions for increasing compliance with treatment in this cohort have been provided (Moulding & Kyrios, 2006). Specifically, it has been recommended that clients should learn when not to act to control a situation. One way this could be done is by focusing treatment on clients’ beliefs in their ability to yield control (Moulding & Kyrios, 2006) in lieu of using more active strategies to regain a sense of control (e.g., compulsive or ritualistic behaviors). For purposes of exposure treatment, yielding control would include fully experiencing symptoms of anxiety during exposure and not completing compulsions to control distress or reduce the impact of a feared situation. This behavior is the standard expectation for those engaging with exposures; however, this often is difficult for clients, especially during early phases of treatment.

Available literature suggests successful yielding of control can be completed with a variety of techniques, including visualizing success, mindfulness, and positive self-statements or self-talk (Shapiro & Austin, 2007). The current study elected to focus on positive self-talk for a number of reasons, including that positive self-talk is less studied in the clinical psychology literature than other approaches, particularly with adults suffering from OCD symptoms. Moreover, positive self-talk has been identified as a way to enhance clients’ motivation (Shapiro
& Austin, 2007), a factor that has been implicated in treatment engagement and dropout for clients with OCD who engage in ERP (Maltby & Tolin, 2003). Unlike other techniques used to supplement ERP in the past, including motivational interventions, positive self-talk is simple and cost effective to implement. It requires little training for clinicians, is straightforward and easy to understand, and would require minimal time to explain to and train clients. Further, positive self-talk largely is implemented by the client, a factor which would increase autonomy in treatment and allow for seamless integration before, during, and after engaging in exposures. Client implementation of positive self-talk also allows for this strategy to be used outside of a treatment setting, allowing for use during homework assignments and other self-directed exposures when a clinician may not be present. This is a unique factor that is not available with clinician-directed motivational interviewing techniques currently used in the literature. Given these factors, positive self-talk can serve as a succinct adjunct to ERP without detracting from treatment goals.

Positive self-statements can be used to facilitate change efforts, particularly when those efforts are related to the yielding of control. Although the use of positive affirmations or self-statements may seem simplistic, this approach has not been widely studied in the clinical psychology literature. Verbalizing positive statements can have a “profound” effect in assisting individuals with transitioning to feeling as though their sense of control results from positive yielding instead of overcontrolled behaviors (Shapiro & Austin, 2007, p. 220). Reducing overcontrolled behaviors, in combination with increasing clients’ sense of control, may reduce apprehension about engagement with exposures (Maltby & Tolin, 2003). Thus, one avenue for enhancing ease of exposure includes examining the impact of motivational-based literature, specifically literature encompassing positive self-talk, for clues to enhance the behavioral
approach and treatment adherence required for exposures. As mentioned, research examining use of positive self-talk is limited in the OCD literature; however, positive self-talk has been examined in depth in the sports psychology literature. Given the larger literature base and successful outcomes experienced by athletes, literature from the sports psychology field was used to inform the current study.

**Self-Talk: Background**

Self-talk is widely studied in the sports psychology field and has been shown to have numerous positive effects on performance. According to Theodorakis and colleagues (2000), self-talk is defined as verbalizations people make to themselves, either overtly or covertly. Hardy (2006) elaborated on this definition to indicate self-talk often is multidimensional in nature, is dynamic and contains interpretive elements, and can serve a number of functions. Although it has been argued it may be more correct to refer to the phenomenon described above as “self-statements” or “verbalizations” (Hardy, 2006), for the purposes of the current project, all constructs described fitting the above definition will be referred to as self-talk.

Self-talk has been suggested to influence performance across relevant domains in sporting events in numerous ways, including by (1) assisting with the acquisition of skills, (2) increasing the development of self-confidence, and (3) assisting with the self-regulation of habits and other behaviors (Zinsser, Bunker, & Williams, 1998). Self-talk is further categorized within these domains by valence and function. The content of self-talk is classified as being positive, negative, or neutral, with the type used varying based on the task an individual is trying to
accomplish (Moran, 1996). In general, positive self-talk is viewed as adaptive and has been shown to increase focus, reduce the amount of time spent dwelling on past errors or failures, increase confidence, increase control over anxiety, and assist and enhance performance. Conversely, negative self-talk is viewed as maladaptive and has been shown to produce anxiety, be counterproductive to achieving goals, and hinder performance (Hardy, 2006; Hardy, Jones, & Gould, 1996; Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004).

Functions of self-talk have been conceptualized utilizing Pavio’s (1985) theories of the functions of imagery. From this theory, two broad self-talk functions have been identified: instructional or motivational (Hardy, 2006; Hardy, Gammage, & Hall, 2001; Hatzigeorgiadis, Zurbanos, Galanis, & Theodorakis, 2011). That is, self-talk allows individuals to direct their performance toward a desired outcome (instructional) or think more appropriately/effectively about their performance (motivational). Instructional self-talk emphasizes the technical aspects of performance (e.g., accuracy, timing, step-by-step reminders). On the other hand, motivational self-talk is intended to serve to control arousal levels and increase mental toughness, focus, and confidence. Further, motivational self-talk is related to mental preparation prior to facing challenging circumstances (Hardy, 2006).

Self-Talk: Theories

Multiple theories identifying the functions of self-talk and the mechanisms through which it is effective have been presented in the sports psychology literature. Contemporary theories purport the following mechanisms as pathways through which self-talk is effective: focusing of
attention, self-efficacy, information processing, and imagery. The first theory posits self-talk may yield beneficial effects by focusing attention during challenging situations (Bell & Hardy, 2009; Landin, 1994; Landin & Hebert, 1999). Engaging in self-talk can reduce the occurrence of interfering thoughts, thus enhancing concentration on challenging tasks and narrowing attentional focus in a manner that enhances performance (Hatzigeorgiadis et al., 2004).

A second explanation for the mechanisms through which self-talk is effective is Bandura’s self-efficacy theory, which identifies verbal persuasion as a source for effective beliefs (Bandura, 1997; Hardy 2006). Bandura suggests if an individual is knowledgeable and possesses expertise related to the task at hand, persuasive statements would be successful at increasing self-efficacy. Findings highlighting the effects of self-talk on confidence and self-efficacy are mixed, with some studies finding beneficial performance effects when positive self-talk is implemented (e.g., Van Raalte et al., 1995; Weinberg, Grove, & Jackson, 1992) and others finding no effect. Tod, Hardy, and Oliver (2011) found the effects of self-talk on confidence were inconsistent, with only 43% of studies examined finding a positive effect; the others found no effect. However, when the type of self-talk was also considered, results suggested all studies using positive, motivational self-talk enhanced confidence (Theodorakis et al., 2000; Tod et al., 2011), which is consistent with the role of verbal persuasion proposed by Bandura (1997). Further, engaging in positive self-talk has been associated with willingness to persist on a challenge task, a relationship that may partially be explained by increased self-efficacy (Chiu & Alexander, 2000).

The final two theories highlight the importance of information processing and imagery. As such, existing literature has found these theories to be more relevant for instructional
compared to motivational self-talk. The third theory highlights the role of the information processing system and its relation to behavior control. Research suggests utilizing self-talk positively influences processing of information related to motor activities and movement sequences by helping athletes search for correct task stimuli, aiding in decision making, and readying the body for action (Landin, 1994). Lastly, researchers have suggested self-talk may increase performance by facilitating mental imagery (Hardy, 2006). Similar to self-talk, imagery is idiosyncratic—images could be interpreted differently across individuals. Models of mental imagery have identified verbalizations as playing a significant role in motor imagery, which serves as an action-language bridge for athletes (Annett, 1988). By describing actions or using instruction-based self-talk, individuals can help to correctly identify and enact related body movements.

Use of Self-Talk in Sports Psychology Literature

Sports psychology research has examined the impact of self-talk strategies on facilitating and improving performance and learning across multiple sports. Different design approaches (e.g., survey, experimental, intervention designs) have been utilized to assess the impact of self-talk on performance (Hatzigeorgiadis et al., 2009; Zinsser, Bunker, & Williams, 2010). Efficacy of self-talk implementation has been assessed with emphasis placed on the valence, function and source of self-talk statements, and method used to implement statements. Of note, a majority of self-talk studies within the sports psychology literature have used students for subjects in a
laboratory setting, with less than a quarter of studies included using “talented or elite-level” athletes (Tod et al., 2011, p. 672). Further, relatively small sample sizes tend to be used, with 32 of 47 studies from Tod and colleagues’ (2011) review using 59 participants or fewer.

Valence. The bulk of the self-talk literature published in the sports psychology field has examined the valence of self-talk and associated benefits/detriments. Most sports literature focuses on the bipolar dichotomy of positive versus negative self-talk on performance, with little emphasis placed on neutral statements used during sporting events (Hardy, 2006). Extant findings implicate positive self-talk in aiding performance and negative self-talk in hindering it (Zinsser et al., 2010). Results from laboratory studies yield stronger support for the benefits of positive self-talk than do field studies (Hardy et al., 1996). For example, a field-based survey study of elite divers (N = 44) trying to qualify for a diving team indicated non-qualifiers used more positive self-talk than qualifiers (d = .17; Highlen & Bennett, 1983). Conversely, laboratory studies regularly find positive self-talk improves performance compared to negative self-talk and control groups, including on a dart throwing task utilized by multiple researchers. Van Raalte and colleagues (1995) assessed dart throwing abilities in 15 practice and 14 experimental dart throws. Participants in the control condition (n = 20) were not given self-talk instructions; those in the positive self-talk condition (n = 20) were asked to say “you can do it” before each throw, and those in the negative self-talk condition were asked to say “you cannot do it” before each throw. Results indicated participants in the positive self-talk condition performed significantly better than participants in the negative self-talk condition (t[57] = 3.03, p < .005) and control condition (t[57] = 1.98, p = .05).
Survey studies, observation-based studies, and experimental studies have been completed in the sports literature in an effort to assess the impact of positive and negative self-talk on performance. For example, Hamilton, Scott, and MacDougall (2007) examined the effect of self-talk interventions on endurance performance in student cyclists ($N = 9$) using a multiple-baseline design. Student participants completed two 20-minute cycling sessions per week for five weeks after being randomized into one of three conditions in which they were encouraged to use self-regulated positive self-talk, assisted positive self-talk, or assisted negative self-talk. Participants in the self-regulated condition were provided with a list of self-statements they could use or modify at the beginning of each cycling session, including phrases such as, “I can maintain this pace,” whereas those in the assisted conditions listened to audio tapes while cycling and were instructed to internalize the statements they heard. The positive assisted condition contained statements identical to the positive self-regulated condition; the negative condition listened to negative comments, including, “I can’t maintain this pace.”

Hamilton and colleagues (2007) found positive self-talk, regardless of delivery format, had beneficial effects on performance. Participants in these conditions displayed increased work per minute compared to baseline ($d = 1.79 – 5.11$) and less variability in performance. Findings from the negative self-talk condition were mixed, with some participants displaying improved performance over time and others displaying a decrease in work per minute and/or increased performance variability. These inconsistencies were attributed to the athletes’ interpretations of the negative statement. Some research shows negative self-talk can be interpreted as a challenge for certain athletes and therefore can serve as a motivation to increase performance (e.g., Van Raalte, Brewer, Rivera, & Petitpas, 1994). Van Raalte and colleagues (1994) found winners of
tennis matches used significantly less negative self-talk than losers ($N = 24$, $F_{[1, 22]} = 7.97$, $p < .02$ ($ES = 1.15$)); however, some athletes who used negative self-talk won matches. For these athletes Van Raalte et al. (1994) suggested negative self-talk could have served motivational functions and reflected the players’ beliefs about their competence. Specifically, it was suggested “‘That stinks!’ may be a way of saying ‘Come on, you are a good player and can do better’” (Van Raalte et al., 1994, p. 412). Findings supporting the notion that negative self-talk can be motivational for some individuals also have emerged in other studies (Goodhart, 1986; Hardy, Hall, & Alexander, 2001); however, systematic research focusing on the function of this motivation or related personality structures that may be predictive of this phenomenon has not been conducted (Hardy, 2006).

When examining beneficial effects of positive self-talk more generally, a recent review by Tod and colleagues (2011) identified 75% of studies found positive self-talk (type unspecified) to have a positive effect on performance. Further, in the same review, all studies utilizing positive, motivational self-talk found positive effects on sport performance. When examining the impact on cognitive anxiety, all studies found beneficial effects of positive self-talk, including anxiety reduction and increased control over anxiety. Conversely, when somatic anxiety was examined, 75% of studies found positive self-talk did not yield a significant effect (Tod et al., 2011).

**Functions.** When used by athletes, self-talk can be classified by the two broad functions previously identified: instructional and motivational. However, sports psychologists have further refined these categories in an effort to gain a better understanding of the function of self-talk.
Motivational self-talk can serve various functions, including motivational arousal, motivational mastery, or motivational drive. Self-talk serving a motivational arousal function is designed to “psych up” or relax an athlete or allow for general control of arousal. Motivational mastery self-talk contains content designed to build mental toughness, increase confidence, and assist with mental preparation. Lastly, motivational drive self-talk is designed to regulate or increase the drive (internal motivation) and effort exerted by athletes (Hatzigeorgiadis et al., 2009). Similarly, instructional or cognitive self-talk also is multifaceted. The instructionally specific function of self-talk refers to specific skill learning and development, whereas the instructionally general function contains statements about general strategy and performance enhancement.

Contemporary research has examined the impact of different types of self-talk on task effectiveness. Inconsistent findings within the sports psychology literature sparked the development of the matching hypothesis, which states the effectiveness of self-talk is partially dependent on the match between task type and self-talk type (Theodorakis et al., 2000). Specifically, the hypothesis suggests instructional cues should be more beneficial for tasks requiring fine motor skills, whereas motivational cues should be more beneficial for gross motor tasks.

Hatzigeorgiadis and colleagues (2004) tested this hypothesis in college students enrolled in a swimming class utilizing two independent experiments. In experiment one, students ($N = 60$) were randomized into one of three conditions—instructional self-talk, motivational self-talk, or a control group—and were asked to execute a precision task: throwing a water polo ball and hitting a target. None of the participants had previous water polo experience. After a baseline throwing assessment, participants in the active condition were told they were testing the
effectiveness of a learning strategy by saying key words immediately before each throw. Students in the motivational condition repeated the key words “I can,” while those in the instructional condition repeated “ball target.” Participants in the control condition were not assigned key words. Instead, they completed the baseline assessment a second time and were excused. Results indicated students in both experimental conditions improved their performance when compared to the control group ($d_s = .99 – 1.39$); however, the instructional condition displayed more improvement than the motivational condition ($d = .24$).

In experiment two, Hatzigeorgiadis and colleagues (2004) utilized a new sample of college students enrolled in a swimming class ($N = 60$), again without any water polo experience, and randomized them to the same conditions described in experiment one. To assess the impact of self-talk on throwing distance, participants were asked to complete a baseline throwing assessment. After this assessment, those in the motivational condition were asked to repeat “I can” before each subsequent throw, whereas those in the instructional condition repeated “elbow hand.” Participants in the control condition completed a second assessment identical to the baseline without stating any key words. Interfering thoughts also were measured during baseline and assessment tasks for all conditions. Results indicated participants in the control and instructional conditions did not display changes in performance between baseline and assessment. Those in the motivational condition showed improved distance with their throws ($d = .20$). When examining interfering thoughts, the control group did not display any changes between baseline and assessment; however, both the instructional and motivational groups displayed significant reductions in the amount of interfering thoughts present during the assessment ($d = .54$).
Taken together, results from both experiments conducted by Hatzigeorgiadis and colleagues (2004) suggest self-talk in general is beneficial for performance enhancement; however, instructional self-talk had a greater effect on improving precision, whereas motivational self-talk had a greater effect on improving power. Of note, motivational self-talk improved performance on both tasks assessed, but instructional self-talk only increased performance for the precision task. However, both forms of self-talk were effective for reducing the amount of interfering thoughts experienced by study participants. These findings provide support for the matching hypothesis and for the beneficial nature of self-talk in focusing attention and enhancing performance.

**Source.** Self-talk can originate from a variety of sources, and therefore whether the self-statements used are assigned to an athlete or freely chosen may have implications for effectiveness. If self-statements are assigned, athletes are provided with statements to say to themselves and do not play a role in decision making. Conversely, freely chosen statements are decided by the individual athlete, often resulting in more natural, spontaneous statements. Laboratory-based studies more commonly use assigned self-talk (e.g., Theodorakis et al., 2000); however, researchers have adapted an additional approach that provides an element of choice to participants but maintains standardization within the study design. In studies using this approach, participants are provided with a list of possible statements and are asked to select statements from the list (e.g., Harvey, Van Raalte, & Brewer, 2002; Schüler & Langens, 2007). According to Theodorakis, Hatzigeorgiadis, and Zourbanos (2012), more recent studies tend to adopt a self-determined approach and allow participants to select or generate their own statements and decide
when/how they will be implemented. This approach significantly limits the control a researcher has; however, it may increase the effectiveness of self-talk because it will better fit the needs and preferences of individual participants.

Although a direct comparison between the effectiveness of assigned and freely chosen statements has not been completed (Theodorakis et al., 2012), it has been suggested that Deci and Ryan’s (1985) cognitive evaluation theory can be used to inform the most effective approach (Hardy, 2006). The cognitive evaluation theory suggests statements freely generated by an athlete may have the most influence on intrinsic motivation (Deci & Ryan, 1985). However, the expertise level of athletes may impact the effectiveness of statements and therefore the factor should also be considered. In fact, Theodorakis et al. (2000) suggest athletes may require practice to learn how to effectively generate and utilize verbal cues; therefore, it is recommended individuals with more expertise be involved in the development of statements. Taken together, these findings suggest verbal cues may be most effective when coaches and athletes collaborate on statement development. A combination of a coach’s expertise paired with the increased motivational influence from the athlete are predicted to result in the most effective statement (Hardy, 2006; Palmer, 1992).

**Verbalization method.** Research examining verbalization method focuses on how an athlete makes self-statements: overtly (externally or aloud) versus covertly (internally or in one’s head). Findings examining the use of overt and covert self-talk in sports settings are mixed, and no study that directly compares their effectiveness has been completed (Hardy, 2006; Van Raalte, Vincent, & Brewer, 2016). However, there are multiple factors viewed as potentially
affecting the importance of verbalization methods for a successful outcome, many of them borrowed from other literature bases. Factors include: (1) valence of self-statements, (2) learning rate, (3) articulation, and (4) social standards.

**Valence.** Available literature suggests positive self-talk is more likely to be internalized than negative self-talk. Overt self-talk and tennis match performance were recorded during two tournament matches. Participants \((n = 20)\) also completed a follow-up measure about their self-talk usage when the matches were complete. Results indicated 54% of players used overt positive self-talk at least once, whereas 21% used overt positive self-talk 13 or more times during matches. When examining negative self-talk usage, 96% of players exhibited overt negative self-talk at least once and 88% more than 13 times during matches. However, when self-reported on self-talk usage, all participants who completed the questionnaire reported numerous usages of positive self-talk. This finding led researchers to conclude that much of the positive self-talk used was covert or private. Given this finding, verbalization method may not be as important when positive self-talk is the focus of study (Van Raalte et al., 1994).

**Learning rate.** Learning rate, or the rate at which athletes are able to learn and implement new skills, has also been examined as a variable that may impact the effectiveness of verbalization methods. Whereas this variable has not directly been tested in the sports literature (Hardy, 2006), research on covert speech has been accessed to conclude verbalization method does not appear to impact learning rates. For example, MacKay (1992) summarized studies
examining phonological speech processes in speech-impaired or speechless individuals. Findings of one study suggested speech-impaired adults performed similarly to individuals with non-impaired speech on memory tasks that required covert speech (Baddeley, 1990). Further, Bishop and Robson (1989) found covert speech could be learned without the articulation or use of facial muscles necessary for overt speech. Children with cerebral palsy who were speechless or speech impaired \((n = 24)\) were compared to matched controls \((n = 24)\) on memory task performance. Tasks involved the use of covert speech or working memory rehearsal. Analysis of variance analyses indicated children with speech impairment performed similarly to controls on their ability to identify rhyming pairs from pictures (i.e., significant main effects were not found). Sixteen speech-impaired individuals, compared to 19 controls, scored better than chance level on rhyming identification tests. Taken together, these results suggest individuals can learn information at a similar rate and pattern whether information is stated or rehearsed overtly or covertly (MacKay, 1992).

**Articulation.** Voice variations, or athletes’ ability to vary the tone or inflection of their voice when articulating self-statements, is another variable that may impact the effectiveness of self-talk (Hardy, 2006). When overt self-talk is employed, an acoustic speech component is present, allowing one to vary the pitch, prosody, and volume of his/her voice as is necessary/helpful throughout training. Further, voices can be altered to mimic other individuals, including coaches or motivational figures. The lack of an acoustic component to covert self-talk prohibits voice variations. Although this difference is notable, more recent physiological research has identified similarities in brain structures implicated in overt and covert self-talk.
(Larraine & Haye, 2012; Van Raalte et al., 2016). For example, Broca’s area, an area of the brain located in the left inferior frontal gyrus that is critical for speech production, has been found to be related to both forms of verbalizations (Morin, 2011; Unterrainer & Owen, 2006). Such similarities suggest the acoustic component of self-talk may not be a critical component to consider for effectiveness.

**Social standards.** A final factor that the sports literature suggests should be examined is the social standards associated with each verbalization method. Research from the clinical psychology literature suggests using overt self-statements increases statement effectiveness. Hayes and colleagues (1985) examined the effectiveness of private and public statements on self-control using a laboratory task. College student participants who believed they had problems with their study skills ($N = 21$) were randomized into one of three conditions: public goal setting, private goal setting, and a control group. Participants in all conditions completed a pretest assessing vocabulary and knowledge of study skills, followed by two meeting sessions (during which they received feedback about their pretest scores) and progress tracking for 36 days. Throughout the study, participants were encouraged to participate in “self-directed studying” modules offered to improve their pretest scores. Participants in the active conditions were asked to set a goal related to how many modules they would complete and their posttest scores. The public goal setting group wrote down their goals and announced them to their treatment group. The private goal setting group wrote down their goals anonymously and were asked not to discuss them with others. All participants then completed the posttest 36 days later.
Results indicated participants performed similarly on the pretest regardless of condition but differed significantly at posttest ($F_{2,18} = 7.14, p < .01$). On average, students in the public condition improved by 26.9%, whereas the private and control groups improved by 9.9% and 10.7%, respectively. Examination of goals suggested participants in the public and private conditions set similar goals ($p > .10$). A proposed explanation for these findings was that public goals were influenced by social standards and self-standards as opposed to self-standards only. The addition of social standards likely increased participants’ accountability and motivation to follow through with goals (Hayes et al., 1985).

Findings from the sports psychology literature support the above results, suggesting that public goals may be more effective. For example, Kyllo and Landers (1995) conducted a meta-analysis comparing the effectiveness of public goals, semiprivate goals, and private goals. Results indicated public goals yielded successful performance-based outcomes with larger effect sizes than both semiprivate and private goals ($d_s = .79$, .20, and .06, respectively). However, more recent research from the sports literature indicates that participants find engaging in external self-talk to be awkward. There are no data assessing the impact of feelings of awkwardness on the effectiveness of self-talk; however, researchers caution that feelings of awkwardness could serve as a distraction for athletes. This distraction could indirectly have a negative impact on the desired outcome of self-talk interventions (Masciana, Van Raalte, Brewer, Brandon, & Coughlin, 2001; Theodorakis et al., 2012). Although this may be important to consider, studies examining this phenomenon did not provide information about the type of self-talk used (i.e., motivational or instructional). It is possible that instructional self-talk (e.g., “ball target”) is more awkward to use overtly than motivational self-talk (e.g., “I can!”) or vice
versa. Further, it also is possible that the identified benefits related to the public nature of external self-talk outweigh any detriment associated with feelings of awkwardness.

**Interventions.** Multiple approaches and interventions have been utilized within the sports psychology literature. Typically, interventions include psychoeducation followed by a training period. The content of material used in both the psychoeducation and training vary depending on the goal of the intervention. Interventions aimed at increasing positive self-talk may contain any or all of the following information: (1) brief description and definitions about self-talk; (2) structure and content of self-talk being used (e.g., motivational, goal-directed, spontaneous); (3) information about the benefits of positive self-statements, including the ability to increase confidence, prolong persistence, and increase effort exerted; and (4) instructions for how to effectively implement positive self-talk (Hamilton et al., 2007; Latinjak, Hatzigeorgiadis, & Zourbanos, 2016).

Following the instructional period, athletes typically are provided with self-talk words or phrases, either to be used as examples for self-generated statements or to be memorized and used during training sessions. The content of statements varies based on the goal of the study, but research has shown that cues should be (1) brief and phonetically simple, (2) associated with the skill or task that will be executed, and (3) compatible for the timing pattern of the task (Landin, 1994). These cue recommendations are applicable across self-talk functions (i.e., motivational or instructional); however, whereas recommendations (2) and (3) appear more salient for instructional tasks, brevity is equally important across functions. This is because as the brevity and simplicity of a cue decrease, the possibility for distraction and disruption in performance
increases (Landin, 1994); therefore, the literature recommends using one to four simple words that support the goal of the athlete, are logically related to the task, and elicit a powerful mental image when verbalized (Madigan, Frey, & Matlock, 1992; Mahoney & Avener, 1977).

Interventions developed to target negative self-talk are less common in the sports psychology literature. Available literature highlights the use of thought suppression and thought stopping interventions (e.g., Dugdale & Eklund, 2002; Theodorakis et al., 2012). Researchers have attempted to tap into the power of non-negative thinking (e.g., Kendall, 1984) by introducing thought stopping/suppression interventions. Results on the topic are mixed, with literature suggesting that it is difficult for individuals to stop using negative self-talk, including in sports settings. Van Raalte and colleagues (2016) suggest one reason it may be more difficult to stop negative self-talk than to generate positive self-talk is because of the automaticity of negative self-talk and the related intuition (or “gut feelings,” p. 146) and attributions. These factors make it more difficult to respond quickly and implement logical arguments and new information (Kahneman, 2003). Therefore, whereas it would be beneficial to stop negative self-talk, similar benefits may be reached more quickly and efficiently by implementing positive self-talk instead (Van Raalte et al., 2016). Of note, collapsing across interventions, results from the sports psychology field indicate that interventions that include self-talk training were more effective than interventions without a training component (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011).
Summary of Effects

The self-talk literature is expansive and multifaceted. In general, findings suggest interventions including explicit training in self-talk were more effective than interventions without explicit training (Hatzigeorgiadis et al., 2011). Further, results indicate the valence of the self-talk used has more influence on performance than individuals’ belief in the self-talk statements they were using (Araki et al., 2006); however, in order to maximize potential benefits of self-talk, it is recommended that approaches be tailored for the situation and be introduced early in the learning process. During later stages of learning, cognitive activity decreases as a result of increased automaticity, which decreases the amount of self-talk being used. Therefore, individuals who are learning a new skill benefit from the use of self-talk more than experienced individuals (Tod et al., 2011).

Numerous studies converge to suggest beneficial effects are found when positive self-talk is brief and motivational. That is, self-talk phrases should contain one to four words and be motivational in nature (vs. instructional). Research examining the assignment and verbalization methods of self-talk in general, and positive self-talk specifically, has resulted in mixed findings. Regarding assignment, personal involvement of the athlete has been identified as a variable that may increase the effectiveness of positive self-talk; however, when research contained novice athletes, it was beneficial for athletes to have guidance from coaches or more senior athletes when generating self-talk statements. In an effort to implement these findings, research studies commonly use a hybrid method that allows individuals to select from a list of assigned statements.
When examining how self-talk is verbalized, overtly or covertly, no studies from the sports psychology literature directly compare the effect of these methods. It has been suggested verbalizing statements may be awkward for athletes; however, clinical psychology literature suggests verbalizing goals and making them public can increase motivation to complete them successfully.

**Self-Talk and Psychopathology**

Self-talk also has been studied in clinical psychology, albeit on a much smaller scale than in sports psychology. Studies have focused on the relationship between self-talk and various forms of psychopathology, including depression, anxiety, and OCD, and its role in interventions. For the purposes of the current review, background from the anxiety and OCD literatures is provided. Of the studies that have been conducted, a majority target children or adolescents. One explanation for this pattern may be that therapists tend to use cognitive restructuring techniques with more experiential support (e.g., identifying and challenging thinking errors) with adults; however, these techniques may be too advanced for children. Given the literature, findings from youth anxiety disorders are presented and extrapolations made to the adult literature. Where available, information from the adult literature is referenced.

**Anxiety.** Completed research has examined the impact of self-talk valence and content on cognitions and its role in the etiology, maintenance, and treatment mechanisms for anxiety. Studies examining valence tend to emphasize positive self-talk, negative self-talk, or a
combination. Content-specificity studies often examine future-oriented questioning that spans multiple dimensions, including danger, harm, and threat, as these topics have been identified as consistent with anxious negative self-statements (Kendall & Treadwell, 2007). When focusing on negative self-statements in children specifically, statements also tend to include themes of preoccupation and negative self-evaluation (Prins & Hanewald, 1997; Szabo & Lovibond, 2004).

**Child and adolescent anxiety.** Self-talk has been examined as a factor that contributes to childhood symptoms of anxiety and has been targeted as a potential mechanism for change (Kendall & Treadwell, 2007). The childhood self-talk literature spans a variety of dimensions, including the valence and content of covert dialogue and the ratio of positive to negative statements used. In general, negative self-statements naturally occurred more frequently in children who reported elevated levels of anxiety. The content of these negative statements varies, with some being classified as anxious self-statements and others as depressive self-statements. Both anxious and depressive statements have been associated with symptoms of GAD ($r = .61$), OCD ($r = .58$), separation anxiety ($r = .62$), and panic ($r = .77$; Muris, Merckelbach, Mayer, & Snieder, 1998).

In children, the relationship between anxiety and positive self-talk generally is mixed. Some studies do not find a relationship between the variables; others find increases in positive self-talk related to decreases in anxiety symptoms ($\beta = -.24; p < .05$) and anxiety diagnosis ($\beta = -.33; p < .05$; Kendall & Treadwell, 2007). Conversely, existing literature identifies changes in negative self-statements, particularly anxious self-statements, as a consistent outcome predictor,
with reduced negative statements associated with reduced anxiety symptoms (e.g., Kendall & Treadwell, 2007; Treadwell & Kendall, 1996).

Kendall and Treadwell (2007) examined the role of valence and content of self-statements as predictors of anxiety and treatment moderators in children. Children with anxiety disorders (GAD or social phobia) and those without, along with their parents and teachers, completed a battery of questionnaires assessing symptomatology and general functioning. Children in the anxiety disorders group were randomized into a wait-list control or treatment condition. Those in the treatment condition completed Coping Cat treatment (Kendall, 1990). This cognitive-behavioral treatment aims to help children recognize and analyze anxious cognitions and develop strategies to manage anxiety-provoking situations, including behavioral strategies such as in vivo exposure and role play. The treatment includes 16 weekly sessions (Kendall et al., 1997). Results suggested anxious negative self-statements significantly moderated the relationship between treatment condition and treatment outcome as measured by multiple outcome measures \((z_s = \mid 2.0-2.1 \mid \quad ps < .05)\), but positive self-statements and depressed negative self-statements did not. These findings support the notion that anxious negative-self statements can be detrimental and are related to psychopathology. Further, when examining statement content, Kendall and Treadwell (2007) found that negative statements that focused on threat and harm (anxious negative self-statements) were more likely to predict maladjustment as a result of anxiety; those focused on loss and well-being (depressed negative self-statements) were less likely to predict maladjustment.

Although not directly related to an anxiety disorder, competitive anxiety also has shown to be related to negative self-statement generation in adolescents. Hatzigeorgiadis and colleagues
(2009) recruited 72 competitive adolescent tennis players. They were randomized into one of two conditions after assessing baseline performance of specific tennis-based skills under a stressful situation. Individuals in the experimental condition were asked to utilize positive self-talk during training; those in the control condition did not. Results indicated individuals who utilized positive self-talk during their final assessment reported significantly higher self-confidence \((F_{[1, 62]} = 5.06, p = .03; \eta^2 = .08)\) and lower cognitive anxiety \((F_{[1, 62]} = 4.96, p = .03, \eta^2 = .07)\) than individuals in the control group. In addition, the experimental group evidenced increased performance on the tennis skills assessed \((F_{[1, 62]} = 19.46, p < .001, \eta^2 = .24)\).

**Adult anxiety.** In adults, self-talk patterns also have been shown to play a role in public speaking anxiety and communication apprehension, or “fear or anxiety associated with either real or anticipated communication with another person or persons” (McCroskey, 1977, p. 78). Shi, Brinthaupt, and McCree (2015) assessed the impact of self-talk on these two outcome variables in a sample of undergraduate students across two studies. In the first study, student participants \((N = 209)\) completed the Self-Talk Scale (Brinthaupt, Hein, & Kramer, 2009) and a measure of communication apprehension. Results of a hierarchical multiple regression indicated self-critical self-talk—a type of self-talk considered to be negatively valenced—was the strongest predictor of feelings of apprehension related to communication \((\beta = -.19; p < .05)\).

In a second study, Shi and colleagues (2015) utilized an independent sample of undergraduate students \((N = 198)\) enrolled in a public speaking course to assess the relationship between task-specific self-talk and public speaking anxiety. Participants completed measures assessing public speaking anxiety and situation-specific self-statements. Results of a hierarchical
multiple regression indicated individuals who used critical self-talk while preparing for a speech reported higher levels of anxiety ($\beta = .15; p < .05$). Conversely, individuals who reported using encouraging or supportive self-talk while preparing for a speech reported less anxiety about public speaking ($\beta = -.28; p < .001$). Results of these studies highlight the detrimental effects of negative self-talk and beneficial effects of positive self-talk on performance and communication anxiety.

Related research conducted by Cacioppo, Glass, and Merluzzi (1979) identified a relationship between self-statement valence and social anxiety. Male undergraduate students ($N = 58$) with high to low social anxiety were asked to record any self-statements they experienced after being told they would be conversing with a female student. Results indicated men who reported elevated social anxiety symptoms on the Social Avoidance and Distress Scale (Watson & Friend, 1969) generated more negative self-statements than did the low-anxiety men ($F_{1, 54} = 7.25, p < .01$). Moreover, results suggested negative self-statements were related to negative self-evaluations men experienced following a discussion with a female ($r = -.32$ to $-.34; p < .05$). These results provide further support for the link between negative self-talk and anxiety and suggest negative self-talk can lead to negative self-evaluation, which can impair confidence and performance.

The adult anxiety literature also has examined the impact of self-statement valence on competitive anxiety during a sports-based performance. Researchers examined the impact of a number of self-talk dimensions on cognitive and somatic anxiety related to sports performance in undergraduate students who engaged in recreational activities ($N = 438$; Conroy & Metzler, 2004). When succeeding in their activities, participants reported significantly ($ps < .05$) higher
levels of positively valenced self-talk (e.g., self-affirming, $d = .69$; actively self-loving, $d = .88$) and less negatively valenced self-talk (e.g., self-blaming, $d = .99$; self-attacking, $d = .58$) than when failing at activities. Of note, all participants reported wanting to increase their use of positive self-talk dimensions to treat themselves in a more positive manner. Regarding anxiety, self-talk was associated with increased state anxiety symptoms when individuals failed at recreational activities ($F_{[8, 399]} = 13.40, p < .01, R^2 = .21$). High levels of anxiety were associated with low levels of positively valenced self-talk (e.g., self-emancipation, $\beta = -.14; p < .05$) and high levels of negatively valence self-talk (e.g., self-attacking, $\beta = .19; p < .05$).

**Anxiety summary.** In sum, negatively valenced self-talk has been implicated in various forms of anxiety across age dimensions and has been associated with detrimental outcomes, including increased anxiety symptoms. The role of positive self-statements has been identified in a handful of studies in the childhood and adult anxiety literatures, but it is not as well researched as are negative statements, resulting in limited applications (Kendall & Treadwell, 2007). Further, the role of talking back to negative cognitions, or aiming to restructure them by emphasizing positive self-statements, has been examined even less, particularly in the adult literature.

**OCD.** When narrowing the search to the use of self-talk in conjunction with treatment for OCD, available literature is even more limited, with the majority of information being provided via treatment manuals and related literature aimed at treating pediatric or adolescent OCD.
Research suggests that when undertaking ERP tasks individuals tend to engage in negative self-talk, which undermines their abilities and further fuels OCD symptoms. Specifically, negative self-talk can increase anxiety or distress experienced before, during, or after exposures. It has been shown that children engage in more negative self-talk than adults, and therefore researchers have developed treatments that recommend “talking back to OCD” or “bossing back OCD” as part of cognitive training (March & Mulle, 1998).

**Self-Talk Interventions**

A number of self-talk interventions have been developed in an effort to reduce negative self-talk and/or increase positive self-talk. Self-talk interventions used in research settings often are used as stand-alone interventions to allow for increased experimental control and clear identification of intervention effectiveness. However, when self-talk interventions are included within treatment manuals, particularly those for OCD, they are used in conjunction with other forms of therapy (e.g., behavioral or pharmacological). For example, self-talk interventions serve as a cognitively based treatment component in OCD treatments but are paired with behavioral treatments (i.e., exposures). For the current review, three interventions utilizing self-talk procedures are discussed in detail: self-instructional training (SIT; Meichenbaum, 1977), Talking Back to OCD (March & Benton, 2007), and Brain Lock (Schwartz & Beyette, 1996). Although these interventions are the most relevant to the current study, it is important to note that other interventions also utilize self-talk procedures. Some of these interventions include thought stopping and cognitive restructuring. Additionally, *Coping Cat Workbook* (Kendall, 1990) and
Think Good, Feel Good, Second Edition: A CBT Workbook for Children and Young People (Stallard, 2019), cognitive-behavioral treatment programs developed for children and adolescents, include self-talk as a treatment component. However, these interventions do not focus on the generation of positive self-talk to combat anxiety and OCD symptoms. Of note, Think Good, Feel Good promotes the use of general positive self-talk to take notice of achievements. In contrast, SIT, Talking Back to OCD, and Brain Lock place emphasis on positive self-talk generation for the purpose of targeting anxiety-specific distress. Given this fundamental difference between interventions, only the latter are discussed.

**SIT procedure.** Self-instructional training (SIT) was developed by Donald Meichenbaum as an intervention to supplement existing treatment approaches. Originally, SIT was designed to assist hyperactive, impulsive children in using self-talk to develop self-control. Since its development, SIT has evolved and now is applicable for use across developmental levels for a number of presenting problems, including helping adult clients to cope with anxiety and other stressors. SIT includes multiple components: (1) a psychoeducational component that provides individuals with a theoretically sound rationale highlighting the effectiveness of utilizing self-talk to cope with stress reactions; (2) teaching individuals positive self-statements that are designed to help them focus on confronting and handling a stressor, coping with feeling overwhelmed, and reinforcing themselves for coping; and (3) rehearsing self-talk statements provided.

Research conducted by Meichenbaum (1977, 1985) indicates SIT procedures are successful in combating anxiety and related stressors because the procedure provides individuals
with an opportunity to engage in anticipatory problem solving and rehearse cognitive coping statements, allowing for more efficient coping while facing a stressor. By rehearsing statements prior to exposure to a stressor, individuals are allowing themselves to experience moderate levels of anticipatory anxiety. This anticipatory anxiety prompts necessary emotion inoculation when the stressor is faced, thereby increasing coping skills (Meichenbaum, 1977, 1985). However, findings from studies conducted by other researchers does not support this notion. In fact, contradictory evidence regarding the effectiveness of SIT emerged.

**Effectiveness.** The SIT procedure has been implemented as an adjunct to exposure therapy for adults diagnosed with phobias. Unfortunately, results supporting the effectiveness of SIT as an adjunct therapy were limited. The SIT procedure was found to be no more effective for coping than providing preparatory information about a fearful situation (e.g., flying) or leaving individuals to their own resources (Girodo & Roehl, 1978). Further, Girodo and Roehl (1978) found using the SIT procedure had the opposite of the desired effect. That is, the more time participants spent using self-statements provided during the SIT procedure, the more anxious they became. This suggests the SIT procedure may be inviting increased levels of anticipatory anxiety instead of reducing overall anxiety as intended.

When SIT was used as an adjunct to ERP for OCD, similar findings emerged. Clients were instructed to become aware of negative self-statements and replace them with positive coping self-statements while completing exposures; however, SIT was not found to be successful in increasing therapeutic efficacy (Emmelkamp, van der Helm, van Zanten, & Plochg, 1980; van Oppen et al., 1995). Researchers suggested using SIT procedures may motivate individuals to
use self-talk techniques but may not have the intended effect on anxiety or distress (Girodo & Roehl, 1978). Further, Kendall (1983) expressed doubt that SIT procedures were an appropriate technique to utilize with clients who are engaging in obsessive behavior, given this population has a higher likelihood of engaging in excessive self-talk, rumination, and doubting.

When comparing coping statements developed by Meichenbaum (1977) for use in SIT to self-statements used in the sports literature, the SIT statements appear to be instructional in nature and are long in length. For example, “Remember, stick to the issues and don’t take it personally,” “Just chunk the stress into manageable units,” “Set up contingency plans, prepare for possibility of becoming extremely stressed,” and “Recognize small gains, don’t belittle gradual progress” are statements that are suggested for use to prepare for a stressor, confront a stressor, cope with the feelings of being overwhelmed, and evaluate coping efforts, respectively (Meichenbaum, 1985). It is possible that the length and detail of the statements serve to distract clients from experiencing the full extent of their anxiety or distress when in a feared situation, preventing habituation and corrective experiences from occurring, thereby contradicting the goal of exposure-based therapies.

Talking Back to OCD. March and Benton (2007) developed a cognitive-behavioral treatment manual to treat OCD in children and adolescents. The treatment utilized self-talk as an integral component of cognitive restructuring, with the goal of helping children talk back to OCD. This process typically involves replacing either overly optimistic or pessimistic statements with realistic self-statements that emphasize the child’s ability to cope with OCD. For example, March and Benton (2007) provided an example of a child preparing to undergo a contamination-
based exposure. An example of negative self-talk that the child could be engaging in is, “I won’t be able to do this. What if I take an even longer shower?” (p. 86). To decrease anticipatory anxiety prior to the exposure and increase motivation to engage with feared stimuli, the authors recommended having the child think the following instead: “This task will be difficult, but I can handle this much anxiety this one time. I’ll use my tool kit” (p. 86).

An alternative approach to cognitive restructuring that allows for a more global application is encouraging children to talk directly to OCD. For example, children are taught coping statements similar to the following: “Go jump in the lake OCD, I’m the boss’ or ‘Can’t catch me this time, OCD!’” (March & Benton, 2007, p. 86). Franklin, Rynn, Foa, and March (2006) discussed the use of self-talk as a form of cognitive training to facilitate engagement with exposure treatment for children. Children learn to “talk back to OCD” (i.e., use positive self-talk) to encourage themselves to remain in feared situations long enough to experience short- and long-term habituation.

Although helpful prior to exposure, this level of self-talk could be distracting during an exposure. Further, although “bossing back” OCD may resonate with children, the same may not be true for adults. In fact, the addition of the self-talk component of cognitive restructuring was a major developmental adjustment to standard CBT with ERP treatment used to treat adults with OCD (Abramowitz et al., 2007). This adjustment altered the approach to the cognitive restructuring portion of the treatment package to allow children to use self-statements to separate themselves from OCD and minimize the significance of obsessions and related symptoms (Abramowitz et al., 2007). As a result, children were able to successfully increase their ability to restructure their dysfunctional beliefs and increase their engagement with exposure treatment.
Children who would otherwise be unable or unwilling to tolerate the distress associated with exposures also saw increased engagement (Franklin et al., 2006). Further, Franklin and colleagues (2006) posited that utilizing self-talk to combat OCD promotes habituation during exposures without ritualizing and can result in a change in core OCD beliefs.

Brain Lock. Schwartz and Beyette (1996) developed a self-treatment manual to assist individuals in the process of changing their brain chemistry and reducing OC symptoms. The program utilizes four steps—Relabel, Reattribute, Refocus, and Revalue—to help individuals “control almost any intrusive thought or behavior” they want to change (Schwartz & Beyette, 1996, p. xx). The program aims to assist individuals in identifying obsessions and compulsions and altering behaviors to reduce both frequency of obsessive thoughts and engagement with compulsions. Self-talk is utilized throughout the program but is most salient in the first two steps.

“Relabeling” is the first step of the Brain Lock program. During this stage, individuals are encouraged to develop an “impartial spectator” (i.e., an ability to remove themselves and observe their actions and thoughts with mindful awareness) to assist with the identification of their obsession and compulsions. Following development of the impartial spectator, stage two, the “reattribute” stage, begins. During this stage, individuals are encouraged to talk back to their OCD and make mental notes such as “It’s not me – it’s my OCD” (Schwartz & Beyette, 1996, p. 10) or “That’s just OCD” (p. 11). The purpose of the self-talk is to increase insight into one’s symptoms, create distance between oneself and urges to engage in obsessive thinking or
compulsions, and to reduce the meaning an individual ascribes to obsessive thoughts and compulsive urges.

Whereas self-talk appears to be a helpful component in identifying obsessive thinking and compulsive urges, the Brain Lock program does not provide specific structure or training regarding how to use self-talk, something that is recommended in the sports psychology literature. Further, the program does not utilize self-talk in a motivational way to assist with behavioral changes, nor is it utilized with exposure-based therapies. Instead, Brain Lock suggests self-talk be used as a “battle cry” (p. 208) to recognize OCD as a disorder and medical condition. Moreover, the program does not discuss the valence of self-talk or suggest individuals use positive self-talk; the examples provided generally are neutral and informative in nature. When categorized utilizing guidelines from the sports psychology literature, the self-talk utilized in the Brain Lock program would be viewed as brief, non-valenced, and a hybrid between motivation and instructional self-talk. As a reminder, self-talk has been identified to be most beneficial when it is brief, positively valenced, motivational, and related to the task at hand.

**Summary**

OCD is a debilitating disorder that causes noticeable impairment across multiple life domains (APA, 2013). Multiple causal mechanisms have been implicated in the development of OCD, including various cognitions. Maladaptive beliefs about control, including sense of control and desire for control, are cognitive control-based deficits that have been implicated in the development of compulsive rituals (Moulding & Kyrios, 2006). Specifically, low levels of
perceived control over a situation in conjunction with elevated levels of desire for control have been linked to OC symptoms across a variety of OCD subtypes, including contamination concerns (Moulding & Kyrios, 2007).

Research has shown that ERP, the current gold-standard treatment for OCD, is effective for approximately 50% of individuals who begin treatment (Abramowitz et al., 2006; Ost et al., 2015). However, engaging in ERP may be particularly difficult for clients whose OC symptoms are exacerbated by an elevated desire for control and low sense of control. One explanation for this finding may be that relinquishing control and allowing oneself to experience heightened levels of distress may be viewed as highly aversive, resulting in lower adherence to treatment and increased likelihood of attrition (Moulding & Kyrios, 2006). Thus, one target for increasing behavioral approach in exposure-based therapy for OCD may be the cognitive, control-based deficits underlying OCD symptoms.

Literature suggests successful yielding of control can be completed with a variety of techniques, one being positive self-talk. Although self-talk research on anxiety and OCD is limited, numerous studies have been conducted in the sports psychology field (Hardy, 2006; Hatzigeorgiadis et al., 2004; Landin & Hebert, 1999). Findings within the sports psychology literature suggest engaging in self-talk has tended toward positive outcomes for athletes, particularly when the self-talk is positive, motivational, brief, assigned, and overt (Hardy, 2006; Tod et al., 2011). Limited research examining the effect of positive self-talk on anxiety and OCD has largely been completed with child and adolescent samples. Although interventions designed to be developmentally appropriate for children are beneficial, those implemented with adults with OCD have had modest success. When children engaged in positive self-talk while
completing exposures, findings suggested using self-talk increased participants’ ability to remain in feared situations long enough to experience short- and long-term habituation, making it a viable option for participants who otherwise would be unable or unwilling to tolerate distress associated with exposures (Franklin et al., 2006).

In addition to increasing children’s ability to engage with feared situations, the literature suggests multiple other benefits for clients who utilize positive self-talk. What people say to themselves affects the way they behave and the way they feel (Ellis, 1976), so it is not surprising that increasing the positivity of individuals’ verbalization yields beneficial outcomes. As mentioned, positive self-talk can be used to facilitate and improve task performance by focusing attention, controlling thoughts, and reducing need for overcontrol of external stimuli (e.g., Hatzigeorgiadis et al. 2004; Hatzigeorgiadis et al., 2009; Shapiro & Austin, 2007). Positive self-talk also can reduce symptoms of cognitive anxiety, combat stress, and enhance self-confidence (Hatzigeorgiadis et al., 2009; Meichenbaum, 1985). Furthermore, positive self-talk can reduce defensive responding to threatening feedback if introduced prior to the feedback being received (Critcher, Dunning, & Armor, 2010).

**Limitations of Existing Research**

Self-talk research in the anxiety and OCD literatures is limited, with a significant portion dedicated to decreasing negative self-talk in lieu of generating positive self-talk (the focus of the sports psychology literature). The first limitation of extant research is that it largely focuses on
the impact of positive self-talk in children, perhaps in an effort to make the process of cognitive restructuring more developmentally appropriate. Whereas beneficial effects were found with children and adolescents diagnosed with OCD, research aiming to translate these findings to the adult literature is lacking. The interventions utilized with the adult population (e.g., SIT) mostly have been unsuccessful in augmenting exposure-based therapies. Further, to the best of my knowledge, none of the existing OCD literature examines the effect of positive self-talk on sense-of-control beliefs, particularly within the context of exposure therapy.

The content of positive self-talk interventions is another limitation of the extant literature. Research assessing the efficacy of self-talk variations, including comparing motivational to instructional or self-generated to assigned self-talk, has not been examined in the OCD literature. Most studies focus solely on valence or content. However, research examining various forms of self-talk has emerged from the sports psychology literature. Although the application of findings from sports psychology differ from those in clinical psychology, the approaches to interventions often are informed by similar theoretical backgrounds. For example, sports psychology research often aims to increase performance during sporting events, and one goal of clinical psychology research is to increase efficacy and dissemination of treatments; however, interventions from both fields utilize Bandura’s theories about self-efficacy when developing interventions. Given these similarities, it is worth considering the translational application of interventions developed in sports psychology, especially when examining self-talk.

A final limitation of current research lies with the interventions used in concordance with ERP for OCD. Even for supplemental approaches that have been successful, limitations include negative side effects, increased treatment time, and fostering of avoidance and other rituals. The
current research is intended to overcome challenges presented by these limitations by introducing a simple, brief augmentation that does not require additional sessions to teach and directly challenges ritualistic behaviors, including avoidance.

Given these limitations, the current study contributed to the understanding of the impact of positive self-talk on individuals’ engagement with feared situations, particularly for those who struggle to maintain elevated levels of sense of control. Given the limited scope of completed research, the current study expands understanding of the impact of positive self-talk on college-aged adults with OC symptoms. Further, the work contributes to understanding of the links among positive self-talk, control beliefs, engagement with feared stimuli, and reduction of automatic or compulsive responses.

**Current Study**

The current research aimed to adapt methods and translate findings from the sports psychology literature into the OCD literature. It explored the effect of implementing a positive self-talk intervention on participants’ willingness to yield control and engage with feared situations, with the ultimate goal of identifying a positive self-talk intervention that can be used to augment ERP. Specifically, individuals with elevated contamination concerns were asked to take part in a self-talk intervention designed to assist with the generation of positive, motivational self-talk. As reviewed, literature supports the use of self-statements that are brief, selected by participants, and overt; therefore, these parameters were applied to the self-statements in the current intervention. The effects of the intervention on anxiety levels, sense of
and desire for control, and urges to neutralize were investigated before, during, and after the intervention as appropriate with self-report measures and a contamination-related BAT. This approach allowed for the measurement of the impact of the novel combination of behavioral strategies on multiple symptom presentations related to OCD (e.g., sense of control, state anxiety, urges to neutralize).

The study had three specific aims. The first was to examine the effectiveness of a positive, motivational self-talk intervention on participants’ self-talk usage during a challenging situation. Introducing self-talk and the potential benefits of implementing strategies should increase the degree to which participants engage in positive self-talk, including when they are asked to engage with stimuli relevant to their OC concerns. Literature from sports psychology suggests completing a self-talk intervention yields better sports-related outcomes than when self-talk interventions are not implemented, with increases in positive self-talk being a likely mechanism for change. Similarly, when ERP has been implemented with children, research suggests integrating motivational self-talk can increase engagement. Further, repeating brief, simple motivational statements to oneself should increase levels of motivation for upcoming tasks. Given the information in support of Aim 1, it was hypothesized that participants who engaged in the active self-talk intervention would report (1a) higher instances of positive self-talk use than those who completed the control condition; (1b) increased confidence in their ability to use positive self-talk effectively, as compared to those in the control condition; and (1c) increased motivation/perceived effort as a result of self-talk usage. Hypothesis 1a served as a manipulation check to ensure that the positive self-talk intervention had the expected effect in the active self-talk condition.
The second aim was to examine the effect of positive, motivational self-talk on individuals’ sense of control and related behaviors. Control-related beliefs have been implicated in the etiology and maintenance of OC symptoms (Moulding & Kyrios, 2006). As a result, it has been suggested individuals who achieve symptom reduction after undergoing CBT/ERP treatment report a decrease in desire to control thoughts while their perceived control over the occurrence of thoughts increases (Moulding & Kyrios, 2007). Sense of control and desire for control constructs are not commonly incorporated into CBT treatments. Given this limitation, Moulding and Kyrios (2006, 2007) have recommended future research utilize cognitive therapy techniques to supplement ERP and assist with yielding of control.

Research has identified self-talk as a mechanism through which individuals can experience a positive yielding of control. As reviewed, positive yielding of control can increase an individual’s sense of control and reduce the urge to utilize overcontrol behaviors such as neutralizing and rituals (Shapiro & Austin, 2007). In the sports psychology literature, use of positive, motivational self-talk—a positive yielding strategy—has shown to increase athletes’ sense of control and decrease cognitive anxiety (e.g., obsessional thoughts; Hatzigeorgiadis et al., 2009). However, these techniques have not been implemented with the goal of increasing sense of control for individuals who report elevated OC symptoms. Based on the above information in support of Aim 2, it was hypothesized that engaging in the active positive self-talk intervention (vs. not) would (2a) increase individuals’ self-reported sense of control over anxiety-related situations and over their cognitions after engagement in a feared situation and (2b) reduce neutralizing urges used by participants in an effort to gain control.
The third aim was to examine the effect of a positive, motivational self-talk intervention on individuals’ willingness to engage with feared situations. The childhood OCD literature suggests talking back to OCD via self-talk assists children in successfully restructuring cognitions (e.g., March & Benton, 2007). However, use of self-talk was an adaptation made in an effort to make cognitive restructuring techniques more developmentally appropriate for children, and its success has not been translated to adults. Further, self-talk methods used to supplement exposure-based therapy with adults have been instructional in nature (and largely unsuccessful). Introducing an innovative motivation-based approach that utilizes recommendations from the sports psychology literature regarding length and content of statements may increase engagement with feared situations. In addition, existing research has shown utilizing self-talk in a challenge situation can increase motivation, self-efficacy, and focus of participants. In fact, according to Bandura’s theory of sources for effective beliefs (Bandura, 1997), utilizing self-talk during exposures may increase one’s ability to successfully complete an exposure and may increase understanding of anxiety. Based on the above information, it was hypothesized that participants who completed the active positive self-talk intervention (vs. not) would display increased engagement with the BAT as evidenced by (3a) less time needed for anxiety to habituate, (3b) greater reduction in anxiety scores, and (3c) greater confidence in their ability to successfully engage with challenging situations.
CHAPTER 2

METHOD

Participants

Based on a G-Power analysis (power = .80, α = .05) examining between-factors MANOVA design with five outcome variables and established effects from studies within self-talk literature (ηp² of .24; Hatzigeorgiadis et al., 2009), the recommended sample size for this study was 48 participants. Given the novelty of the current study and the lack of positive self-talk research in the clinical psychology field, the study initially aimed to recruit 60 participants, 30 per cell, from a pool of undergraduate students enrolled in a psychology course at Northern Illinois University (NIU). Ultimately, a total of 174 participants were recruited via SONA systems. Participants completed the study on a volunteer basis and received partial credit (three of a required eight) toward a course research exposure requirement in return for their participation.

Of the 174 participants, 76 were excluded following the initial screening for not endorsing elevated levels of contamination concerns (i.e., 1 SD above an established student mean, or a score of 14 or higher) based on responses to the 12-item contamination subscale of the Vancouver Obsessional Compulsive Inventory (VOCI-CTM; Thordarson et al., 2004). Additionally, participants were excluded from analysis if they endorsed a current or historic diagnosis of OCD (n = 1), failed too many validity items (n = 4), did not appropriately complete
the behavioral task \((n = 9)\), or had greater than 5\% missing data \((n = 2)\). One additional participant was removed due to errors in procedure. As such, the final sample of \(n = 81\) was retained for analysis. Participant demographics and group-based comparisons from the final sample are reported in Table 1. Significant differences on demographic or key study variables were not found across conditions. Compared to those who were removed from final analysis to those who were retained, there were no significant differences in age \((t(172) = 1.45, p = .15)\), gender \((\chi^2(2) = 1.45, p = .49)\), self-identified race \((\chi^2(4) = 8.38, p = .14)\), or self-identified ethnicity \((\chi^2(2) = 1.23, p = .54)\).

**Self-Report Measures**

**The Vancouver Obsessive Compulsive Inventory (VOCI; Thordarson et al., 2004).**

The VOCI contains 55 items to assess six domains of OC symptomatology. Individuals are asked to rate how true each item is using a 5-point scale, which ranges from 0 (Not at All) to 4 (Very Much). The VOCI can be used to obtain a total obsessional score or six subscale scores, one for each of the following domains: checking (e.g., *I repeatedly check and recheck things like taps and switches after turning them off*), contamination (e.g., *I feel very dirty after touching money*), obsessions (e.g., *I am often upset by my unwanted thoughts or images of sexual acts*), hoarding (e.g., *I have trouble carrying out normal household activities because my home is so cluttered with things I have collected*), just right (e.g., *I often have trouble getting things done because I try to do everything exactly right*), and indecisiveness (e.g., *After I have decided something, I*
Table 1. Sample Characteristics and Baseline Comparisons

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<td>19.32</td>
<td>1.32</td>
<td>79</td>
<td>.19</td>
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</table>
usually worry about my decision for a long time). A participant’s total score can range from 0 (absence of symptoms) to 220 (maximum presence of symptoms).

The VOCI has been shown to have adequate psychometric properties in both clinical and nonclinical samples. The total score and subscales have demonstrated good test–retest reliability in college students over an average of 47 days \((rs > .90)\) and internal consistency (coefficient \(\alpha = .85\) to .96; Thordarson et al., 2004) in clinical samples. In nonclinical student samples, the VOCI has shown to have good internal consistency, with alpha coefficients ranging from .83 to .96 for the total score and subscales (Thordarson et al., 2004), and good convergent validity as evidenced by strong correlations with the Padua Inventory, Washington State University Revision (PI-WSUR; Burns, Keortge, Formea, & Sternberger, 1995; \(r = .79, p < .001\)) and the Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson & Rachman, 1977; \(r = .64, p < .001\)). The VOCI has demonstrated relative discriminant validity in a student sample as evidenced by moderate correlations with measures of depression and anxiety \((rs = .43\) to .44).

The VOCI-CTM was used as a screening measure for participant inclusion. This subscale consists of 12 items and has been shown to be unifactorial in both student and OCD samples. The VOCI-CTM evidenced a mean score of 19.41 (12.51) in an OCD sample and a mean score of 7.31 (6.82) in a student sample (Thordarson et al., 2004). In a sample of students enrolled at Northern Illinois University (NIU; \(n = 1,324\)), the subscale evidenced a mean score of 9.55 (8.85) and sound internal consistency \((\alpha = .90)\). Further, in a study conducted at NIU with individuals identified as displaying elevated contamination concerns, the subscale showed strong convergent and discriminant validity, as evidenced by stronger correlations with the Obsessive Compulsive Inventory-Revised Washing Subscale (OCI-R; Foa et al., 2002; \(r = .46\)) than with
the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977; \( r = .17 \)) or Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990; \( r = .15 \)).

**The Anxiety Control Questionnaire – Revised (ACQ-R; Brown, White, Forsythe, & Barlow, 2004).** The ACQ-R is a shortened version of the original Anxiety Control Questionnaire (ACQ; Rapee, Craske, Brown, & Barlow, 1996), which contained 30 items. The ACQ-R is a 15-item measure designed to assess perceived control over anxiety-related events that span three factors: (1) Emotion control (e.g., *I am able to control my level of anxiety*), which contains five items; (2) Threat control (e.g., *There is little I can do to change frightening events*), which contains six reverse-coded items; and (3) Stress Response control (e.g., *When I am put under stress, I am likely to lose control*), containing four items. Participants are asked to rate to what degree they agree with each of the statements using a 6-point scale ranging from 0 (*Strongly Disagree*) to 5 (*Strongly Agree*). The ACQ-R has shown to perform well in both clinical and nonclinical anxiety adult samples. In an undergraduate sample, the ACQ-R evidenced good internal consistency (\( \alpha = .87 \)) and sound convergent and discriminant validity as evidenced by stronger correlations with the Anxiety subscale from the Depression Anxiety Stress Scale than with the Depression subscale (DASS-21; Lovibond & Lovibond, 1995; Rapee et al., 1996). In the current study, the ACQ-R was used to assess state levels of perceived control pre and post-intervention and behavioral task.
The Desirability of Control Scale (DC Scale; Burger & Cooper, 1979). The DC Scale is a 20-item instrument designed to measure individuals’ need for control over events. Items are rated using a 7-point scale ranging from 1 (This statement does not apply to me at all) to 7 (This statement always applies to me). Items include questions describing control in general terms (e.g., I enjoy being able to influence the actions of others) and some describing specific situations (e.g., I am careful to check everything on an automobile before I leave for a long trip). In nonclinical samples comprised of college students, the DC Scale typically evidences a mean score of 100, with higher scores indicating increased need to control external life events (Burger & Cooper, 1979). The scale has displayed adequate or better psychometric properties across multiple samples. For example, in students the measure displays adequate temporal stability, with a six-week retest coefficient of .75, and good internal consistency (α = .81; Burger & Cooper, 1979). The DC Scale evidences low negative correlations (r = -.19) with the Internal-External Locus of Control Scale (Rotter, 1966), which suggests good discriminant validity.

Functions of Self-Talk Questionnaire (FSTQ; Theodorakis, Hatzigeorgiadis, & Chroni, 2008). The FSTQ is a 25-item instrument designed to assess the following five functions of self-talk in sports settings: (1) Confidence-Belief (e.g., The use of this self-talk cue made me feel more confident in my abilities), (2) Automaticity (e.g., The use of this self-talk cue made me execute automatically), (3) Effort-Motivation (e.g., The use of this self-talk cue made me try harder), (4) Cognitive and Emotional Control (e.g., The use of this self-talk cue made me feel more relaxed); and (5) Attention-Concentration (e.g., The use of this self-talk cue made me concentrate on what I had to do). Each subscale includes five items. Participants are asked to
rate each of the statements using a 7-point scale ranging from 0 (not at all) to 7 (very much). The FSTQ has been shown to have adequate or better psychometric properties when used with student athletes (Theodorakis et al., 2008), with subscales displaying good internal consistency (αs = .89-.96; Hatzigeorgiadis, 2006) and sound retest reliability within a one-month period (r = .81-.88). In the current study, the FSTQ was adapted to assess the effectiveness and function of participants’ use of self-talk as they completed the behavioral task. The Confidence-Belief, Effort-Motivation, and Cognitive and Emotional Control subscales were administered, scored, and used as primary outcome variables, whereas the Automaticity and Attention-Concentration subscales were administered and scored but not used in analyses.

**The BAT Performance Measure (BPM).** The BPM is a 20-item questionnaire developed for the current study to serve as a manipulation check. Participants were asked to rate specific behaviors related to the behavioral approach tasks (described below), self-talk usage and neutralization urges. Regarding self-talk, four quantitative items were used to assess frequency of use of positive and negative self-talk during the behavioral task (e.g., *How frequently did you talk to yourself in your head?*), and one qualitative item assessed content of self-talk (i.e., *What did you say to yourself during the task?*). Further, five additional items were used to gauge understanding of self-talk (e.g., *How confident are you in your ability to use positive self-talk in the future?*). To assess neutralization, participants were asked to rate seven items that assessed how strongly they felt an urge to neutralize after touching contaminants (e.g., *How strong of an urge do you have to wash your hands?*), if they engaged in any neutralization behaviors, and how confident they were in their ability to resist neutralization in the future. A neutralization score
was computed for each participant based on how often they report urges to neutralize and their
confidence in their ability to resist urges to neutralize (reverse scored). Participants answered
these seven items using a 5-point scale ranging from 0 (not at all) to 4 (for a majority of the
task/very well/very confident).

The Self-Talk Scale (ST-S; Brinthaupt et al., 2009). The ST-S is a 16-item
questionnaire designed to assess how frequently and under what circumstances individuals use
self-talk. The ST-S contains four subscales, each with four questions that use the following
sentence stem: “I talk to myself when….” Subscales include: (1) social assessment (e.g., I’m
imagining how other people respond to things I’ve said), (2) self-reinforcement (e.g., I want to
reinforce myself for doing well), (3) self-management (e.g., I want to remind myself of what I
need to do), and (4) self-criticism (e.g., I’m really upset with myself), responded to using a 6-
point scale ranging from 1 (never) to 5 (always). Higher scores denote more frequent self-talk.
The ST-S has evidenced sound psychometric properties in a college-student sample, with
subscales displaying adequate internal consistency (αs = .79-.89) and 3-month retest values
ranging from .50-.69 (Brinthaupt et al., 2009). Further, the ST-S displays sound convergent and
discriminant validity as evidenced by stronger correlations with the verbal scale of the Verbal-
Visual Strategies Questionnaire (r = .47; Brinthaupt et al., 2009) than with a measure of self-
esteem (r = -.06; Rosenberg Self-Esteem Scale; Rosenberg 1965). The ST-S was used to assess
the frequency with which participants utilize self-talk at baseline and the type of self-talk in
which participants engage. The ST-S was supplementary to core measures used in the main study
hypotheses; based on preliminary analyses, it was not used as a covariate for primary analyses.
Belief in Self-Talk Questionnaire (BSQ; Araki et al., 2006). The BSQ is an eight-item self-report measure that assesses participants’ belief in the effectiveness of self-talk. Items are rated using a 6-point scale ranging from 0 (strongly disagree) to 5 (strongly agree), and a single belief score ranging from 0 to 40 is calculated, with higher scores indicating greater belief in self-talk effectiveness. The BSQ evidenced acceptable internal consistency (α = .74) and 2-week retest reliability (r = .82) in undergraduates (Araki et al., 2006; Boroujeni & Ghaferi, 2011). Information regarding discriminant and convergent validity for the BSQ was not available. In the current study, the BSQ was used to assess baseline self-talk beliefs across conditions and was modified slightly (BSQ-II) to measure assumed impact of beliefs during a behavioral task. The BSQ was supplementary to core measures used in the main study hypotheses; based on preliminary analyses, it was not used as a covariate for primary analyses.

The Disgust Propensity and Sensitivity Scale – Revised (DPSS-R; Fergus & Valentiner, 2009). The DPSS-R is a 12-item scale revised from the original 32-item Disgust Propensity and Sensitivity Scale (DPSS) developed by Cavanagh and Davey (2000). The DPSS-R measures two distinct factors that contribute to disgust reactions: disgust propensity (DP; e.g., I avoid disgusting things) and disgust sensitivity (DS; e.g., When I feel disgusted, I worry that I might pass out). Participants respond to the measure by rating how often each statement is true for them personally using a 5-point scale ranging from Never to Always. Six items are summed to measure each DP and DS. For both scales, higher scores indicate more disgust. The DPSS-R displays good internal consistency when examining DP (α = .83) and DS (α = .80), and the scales display moderate to strong intercorrelation (r = .59). Moreover, the DPSS-R demonstrates
adequate representational validity as evidenced by the DP and DS scales consistently correlating with symptoms of disgust-relevant phobias, such as blood and rat phobias (z statistics for pairwise comparisons ranged from 1.74 to 4.28; ps < .05; Fergus & Valentiner, 2009). In the current study, the DPSS-R was used to measure baseline disgust across condition groups as inconsistent scores could have negatively impacted engagement with study tasks. The DPSS-R was supplementary to core measures used in the main study hypotheses; based on preliminary analyses, it was not used as a covariate for primary analyses.

**The Demographic Data Questionnaire (DDQ).** The DDQ is a 20-item questionnaire developed for the current study to assess basic demographic information from study participants. Individuals were asked questions about their sex, age, marital status, religion, race, and employment status. Further, participants were asked a brief set of questions regarding current substance use and history of psychological or psychiatric treatment.

**Behavioral Measures**

**Behavioral approach tasks (BATs).** Two hierarchical BATs were used to assess participants’ ability to approach feared contaminants and were designed to mimic exposure therapy. Participants were asked to rank three contaminants based on how anxious they would feel touching the contaminants with their hands. Options for ranking included the following items, adapted from Najmi and Amir (2010): (1) a pile of dirty laundry that participants were told *may have been touched with bodily fluids*; (2) a mixture of dirt, dead insects, and cat hair;
and (3) a toilet (with an open lid) made to look dirty (see Figure 1). After ranking the items, participants were asked to engage with the contaminant ranked the most anxiety provoking.

To begin the BAT, participants were asked to touch the selected contaminant using both hands, palms down, for up to 10 minutes. Anxiety ratings were collected before the participant touched the selected contaminant (anticipatory), immediately after the participant came into contact with the contaminant (initial), and every minute thereafter until the participant’s anxiety dropped by half or 10 minutes had passed. After participants completed the first BAT (either as a result of habituation or time passed), they were asked to engage in the second BAT by touching their face, one hand on each cheek, for up to 10 minutes. Anxiety ratings were collected at the same time points outlined for the first BAT. Following completion of the BAT, participants were asked about urges to neutralize and any specific behaviors they completed while engaging with the contaminant or immediately following engagement (e.g., hand washing, hand sanitizer use, mental distraction).

**Procedure**

**Informed consent and questionnaire battery.** When participants arrived at the study location, they were asked to read a consent form that highlighted the general goals of the study, study procedures, risks, benefits, and participant rights. Participants were required to provide written informed consent in order to participate in the study. Consenting participants then were
administered a hard copy of the screening measure to confirm study eligibility and OCD diagnostic status. Upon completion of the screening measure, participants were asked to provide basic demographic information and to complete a battery of self-report questionnaires via a secure online platform. The following measures were administered: DDQ, VOCI, DC Scale, ACQ-R, ST-S, BSQ, and DPSS-R. The purpose of these assessments was to collect baseline information regarding self-talk usage, beliefs, and symptoms.

**Condition assignment and completion.** During the first phase of data collection (i.e., Fall 2017 academic semester) study packets that indicated condition assignment were prepared and subject identification codes were assigned to each packet prior to participant arrival. During

![Figure 1. Contaminants for BATs.](image-url)  
The figure depicts the contaminants participants were asked to rank, sight unseen, for use in the BATs. Images are as follows: (Left) Object A: Laundry participants were told “... may have been touched with bodily fluids”; (Middle) Object B: A mixture of dirt, dead insects, and cat hair; (Right) Object C: A toilet made to look dirty.
this phase of data collection, condition assignment (active: positive self-talk condition or control: coloring condition) was completed using block randomization. That is, participant identification codes were randomized in blocks of 10 in an effort to balance randomness against uneven cell allocation. Upon arrival to the study, participants were assigned the next available identification code and subsequent packet. Phase two of data collection (i.e., Spring 2018) utilized an alternative approach to condition assignment. To ensure similar contamination scores and gender division among conditions, participants who completed the study during the second phase of data collection were yoked to existing participants based on VOCI-CTM scores and gender.

Participants who were assigned to the active self-talk condition received brief psychoeducation that (1) introduced self-talk, (2) highlighted the benefits of using positive self-talk in general and the proposed benefits of utilizing it when anxious, and (3) instructed participants in how to use positive statements. Participants then selected two brief motivational statements (e.g., “I can”) from 12 options and were asked to repeat each statement aloud and/or to write it down to increase memory for and accessibility of the statements. Participants who were assigned to the control coloring condition received brief psychoeducation that (1) introduced coloring and (2) highlighted the benefits of coloring, including positive effects on stress and anxiety. Participants then colored a picture of a mandala for 5 minutes, the estimated amount of time it took to complete the active condition.

**Behavioral tasks and post assessment questionnaires.** Upon completion of the assigned condition, participants completed the two BATs. Once the BATs were completed or
terminated, participants completed a final questionnaire battery consisting of the FSTQ, BSQ-II, BPM, and ACQ-R.

**Debriefing.** Following completion or termination of the study, all participants were fully debriefed by the proctor. During debriefing, the proctor provided participants with a written form containing information regarding the specific nature of the study, goals of the study, and rationale for and instances of deception (e.g., the nature of the BAT stimuli and the fact that they were fabricated for safety). The proctor also summarized the debriefing form verbally and answered any questions raised by participants. Finally, all participants were offered printed referral information for counseling services in the DeKalb, IL, area.
CHAPTER 3
STATISTICAL ANALYSIS

Data Screening and Preliminary Analyses

Missing data and outliers. Missing data analyses were conducted using Little’s MCAR test (Little, 1988) to identify possible patterns of missing data (i.e., if results are non-significant, it would suggest data are missing at random). Because analyses indicated data were missing at random (see Results for more information), the expectation maximization (EM) method was used to replace missing values. This two-step, iterative procedure was applied at the item level to reduce the possibility for standard errors and increase available power (Gottschall, West, & Enders, 2012). This method formed a correlation matrix with missing data by assuming the shape of a distribution and basing inferences of missing data on the likelihood under that distribution. To determine the expectations that replace missing data, means, variances, and covariances were estimated from individuals who had complete data available. Next, maximum likelihood procedures were used to estimate regression equations based on the relationship among the available data. The imputation was repeated until the most likely value was obtained for a missing data point (Tabachnick & Fidell, 2013). Prior to completing the primary analyses, the current data were examined and screened for statistical outliers, operationally defined as values 3 SD or more above the identified mean. In order to screen for outliers, descriptive statistics and boxplots were analyzed using the SPSS outliers function.
Violation of assumptions. Following analyses of missing data and outliers, data were assessed for compliance with assumptions associated with analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) testing. Assumptions related to outliers and approximately equal cell sizes previously had been addressed. To test assumptions of linearity, normality, and homoscedasticity, the data were examined using scatterplots, Q-Q plots, histograms, and skewness and kurtosis (i.e., values higher than 2.58). Levene’s and Box’s M tests of homogeneity were used to test for homoscedasticity when the primary ANOVA and MANOVA were completed. Unequal variance between the two conditions would result in the use of Levene’s statistic. Nonlinear transformations were conducted when analyses indicated nonlinearity, and linear transformations were conducted to address heteroscedasticity (e.g., values greater than 10) or non-normality.

Zero-order correlations and reliability. In an effort to assess how study measures performed in the selected sample, zero-order correlations and reliability assessments were completed. A correlation matrix assessing relations among all baseline measures was created to allow for examination of scale relations, including convergent and discriminant validity. Whereas no specific predictions were made regarding individual values, the general pattern expected is that instruments measuring conceptually similar constructs (e.g., VOCI-CTM and DPSSR, which measure contamination concerns and disgust, respectively) should display higher absolute correlations than instruments measuring conceptually dissimilar (or at least less strongly related) constructs (e.g., VOC-CTM and FSTQ, which measure contamination concerns and functions of self-talk, respectively). To test for measurement error, internal consistency
Cronbach’s coefficient alpha) and average interitem correlations (AICs) were computed for each measure and related subscales. Ideally, scales will generate relatively high reliability indicators (e.g., $\alpha = .70-.90$; Cortina, 1993; Tavakol & Dennick, 2011), although too high a value suggests redundancy and may have a negative impact on the overall validity of the scale (i.e., attenuation paradox; Loevinger, 1954). Regarding AICs, ideally scales will display an AIC between .15 and .50; scores for broad, higher order constructs should be expected to fall on the lower end of the range, whereas narrower constructs are likely to display higher intercorrelations (Clark & Watson, 1995). If data are not within expected reliability parameters or do not display expected relational patterns, primary analyses should be completed and interpreted with additional caution.

**Baseline differences across conditions.** Participant assignment to conditions was completed using a combination of random assignment and yoking; therefore, conditions were not expected to differ systematically on any (critical) baseline variables. However, one-way ANOVAs were conducted to test empirically whether there were significant ($p < .05$) baseline differences. If conditions differed on relevant variables (e.g., contamination scores, age, self-talk usage/type) and these variables were correlated significantly with the relevant dependent variable, a MANCOVA or ANCOVA was conducted in place of the MANOVA/ANOVAs described in the primary data analyses section, with the relevant variable entered as a covariate.
Primary Data Analyses

Analyses were conducted using SPSS 22.0. One-way ANOVAs and MANOVAs were used to assess whether participants differed by condition on the relevant dependent variables. With the exception of Hypothesis 2b, MANOVAs were used to assess condition differences on the outcome variables to protect against Type I errors. Hypothesis 2b was assessed using an ANOVA since it involves only one dependent variable.

To test the effectiveness of the manipulation and the hypotheses that individuals who complete the active (vs. control) condition would report (1a) more use of positive self-talk as measured by BPM, (1b) increased confidence in their ability to use positive self-talk as measured by BPM, and (1c) increased motivation as a result of self-talk as measured by the modified FSTQ Effort-Motivation subscale, mean self-report ratings were submitted to a MANOVA. If analyses indicated a significant ($p < .05$) overall multivariate test, it was concluded that condition differences were present. Follow-up examination of univariate analyses indicated if and to what degree the conditions differed significantly on self-talk usage, confidence, and motivation. If Hypotheses 1a-1c are supported and the manipulation was successful, individuals in the active condition should report higher usage of positive self-talk (indicator of manipulation success), increased confidence in their ability to use positive self-talk, and increased motivation to face contaminants.

A second MANOVA was conducted to examine the effectiveness of individuals’ self-talk usage on self-reported sense of control after engaging in a feared situation. To assess whether individuals who completed the active condition reported increased sense of control relative to
those in the control condition, self-report ratings from the modified FTSQ Cognitive and Emotional Control subscale and ACQ-R change scores were submitted to a one-way MANOVA (Hypothesis 2a). A significant ($p < .05$) omnibus multivariate test would indicate conditions differ on their sense of control scores. Follow-up examination of univariate analysis indicated if and to what degree the conditions differed significantly on individual dependent variables. Data patterns were expected to reflect significantly higher cognitive and emotional control as measured by the modified FSTQ Cognitive and Emotional Control subscale and greater change in perceived control over external events from pre to post as measured by the ACQ-R in the active condition relative to the control condition.

To examine Hypothesis 2b, that individuals who completed the self-talk intervention would report reduced neutralization, mean neutralization scores from the BPM were submitted to a one-way ANOVA. A significant ($p < .05$) omnibus $F$ test would indicate different neutralization patterns across condition. Data patterns were expected to reflect lower aggregate neutralization scores in the active (vs. control) condition.

Finally, to examine Hypotheses (3a-3c) and BAT engagement, the following outcome variables were submitted to a MANOVA: time for habituation from BAT1 and BAT2, anxiety score change from BAT1 and BAT2, and confidence in ability to engage with feared stimuli as measured by the modified FSTQ Confidence-Belief subscale. A significant ($p < .05$) omnibus multivariate test would indicate the conditions differ on their sense of control scores. Follow-up examination of univariate analysis indicated if, and to what degree, the conditions differed significantly on habituation time, anxiety change, and confidence scores. If hypotheses were fully supported, individuals in the active (vs. control) condition would take less time to habituate
to the BAT (3a), report greater anxiety change scores (3b), and report increased confidence in their abilities to engage with feared scenarios (3c).
CHAPTER 4
RESULTS

Data Screening and Preliminary Analyses

**Missing data and outliers.** Missing values analysis (MVA) indicated 0.15% of data were missing, with 26 of 240 variables having at least one missing value. Little’s MCAR test (Little, 1988) suggested data were missing completely at random ($\chi^2_{6353} = 0.000, p > .999$). To address the limited amount of missing data, the expectation maximization (EM) method was utilized. During this procedure, each dataset converged in fewer than 35 iterations. Once data were imputed, total scores were computed and outlier analysis was performed on the questionnaire data. Outlier analysis indicated all participants’ scores were within 3 SD of the mean, with the exception of one data point on the BSQ-pre. This identified score was inflated to the next recorded non-outlier score on that measure (Field, 2009).

**Violation of assumptions.** The data then were assessed for linearity, normality, and homogeneity of variance. For linearity, scatterplots demonstrated linear relationships among variables; no parabolic or exponential curve pattern was identified. When examining normality, a majority of scale distributions were deemed normal (i.e., ratio of skewness value to standard error was less than 2.58; Field, 2009); however, the VOCI-CTM and FSTQ displayed significant, positive skew. Homogeneity of variance was assessed using Levene’s and Box’s M tests, which
determined within-group covariance matrices were not unequal. It has been argued that ANOVA and MANOVA tests are robust against violations of normality, particularly if (a) non-normality results from skewness rather than outliers; (b) sample sizes are greater than 20; and (c) cell sizes are similar (Hayes, 1996; Howell, 2010; Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). Additionally, given the skewness and kurtosis values and that Box’s M tests displayed similar score distributions and variability in responding across conditions, literature suggests ANOVA results are likely valid even when data are non-normal (Howell, 2010). As such, the data were not transformed or otherwise adjusted before performing the primary study analyses.

**Measure reliability and zero-order correlations.** Internal consistency tests were completed to examine measure performance in the current sample for baseline (see Tables 2 and 3) and post-manipulation (see Tables 4 and 5) variables. For the overall sample, all coefficient alphas save three were within the desired .70 to .90 range and therefore reflect adequate internal consistency (Tavakol & Dennick, 2011). The AIC of all measures ranged from .16 to .67 in the full sample, with a majority of scores falling between .30 and .59. Of the scales outside of the desired alpha range, the Threat Control and Stress Response subscales of the ACQ-R during pre- and post-assessment displayed coefficient alphas between .61-.69. The Threat Control and Stress Response subscales are short scales consisting of six and four items, respectively, which likely contributes to their lower alphas; however, the AIC values for these scales were .28 and .35 respectively, which is within normal limits. The Self-Talk Scale displayed a coefficient alpha of .94 and an AIC of .48, indicating that although the items are quite highly related, the AIC was
Table 2. Descriptive Statistics of Baseline Measures and Baseline Comparisons for Full Sample

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<th>SD</th>
<th>Range</th>
<th>Alpha</th>
<th>AIC</th>
<th>t</th>
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Note. N = 81. CTM = Vancouver Obsessive-Compulsive Inventory, contamination subscale; DPSS-R = Disgust Propensity and Sensitivity Scale – Revised; DCS = Desire of Control Scale; ACQR-pre = Anxiety Control Questionnaire – Revised at baseline; STS = Self-Talk Scale; BSQ-pre = Beliefs of Self-Talk Questionnaire at baseline. Reported t tests assess mean-level data for between condition differences.
**Table 3. Descriptive Statistics of Baseline Measures by Condition**

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*Note.* VOCI CTM = Vancouver Obsessive-Compulsive Inventory, Contamination subscale; DPSS-R = Disgust Propensity and Sensitivity Scale – Revised; DCS = Desire of Control Scale; ACQR-pre = Anxiety Control Questionnaire – Revised at baseline; STS = Self-Talk Scale; BSQ-pre = Beliefs of Self-Talk Questionnaire at baseline.
### Table 4. Post-Intervention Measures for Full Sample

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<th>Observed Range</th>
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<td>Stress Response (4)</td>
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<td>BSQ-post (8)</td>
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<td>PSTuse (1)</td>
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<td>PSTconfidence (1)</td>
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<td>NeutUrge (5)</td>
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<td>4.13</td>
<td>5-23</td>
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</table>

*Note. N = 81. ACQR-post = Anxiety Control Questionnaire – Revised, post-manipulation; BSQ-post = Beliefs of Self-Talk Questionnaire, post-manipulation; FSTQ = Functions of Self-Talk Questionnaire; BATstep = level of engagement with BATs; BAT1_min = time spent engaged with BAT1 until habituation or discontinue; BAT1_AC = percent anxiety change from pre- to post-BAT1; BAT2_min = time spent engaged with BAT2 until habituation or discontinue; BAT2_AC = percent anxiety change from pre- to post-BAT2; NeutUrge = Neutralization Urge reported following behavioral task completion.*
### Table 5: Descriptive Statistics of Post-Intervention Measures by Condition

<table>
<thead>
<tr>
<th>Scale (# of items)</th>
<th>Observed Active: Self-Talk</th>
<th>Control: Coloring</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>BSQ-post (8)</td>
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<td>NeutUrge (5)</td>
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*Note.* ACQR-post = Anxiety Control Questionnaire – Revised, post-manipulation; BSQ-post = Beliefs of Self-Talk Questionnaire, post-manipulation; FSTQ = Functions of Self-Talk Questionnaire; BATstep = level of engagement with BATs; BAT1_min = time spent engaged with BAT1 until habituation or discontinue; BAT1_AC = percent anxiety change from pre- to post-BAT1; BAT2_min = time spent engaged with BAT2 until habituation or discontinue; BAT2_AC = percent anxiety change from pre- to post-BAT2; NeutUrge = Neutralization urge reported following behavioral task completion.
within normal limits. For all scales, either the alpha, AIC, or both were in the desired range, indicating that in general, the measures performed reliably in the current sample.

Relationships between baseline and dependent measures were examined with correlation matrices (Tables 6-9). Evidence of convergent and discriminant validity was demonstrated by the VOCI-CTM displaying moderate, significant correlations with disgust and sense of control measures and small, non-significant correlations with measures assessing self-talk. Regarding BAT variables, there was evidence of moderate to strong significant correlations with one another. Correlational strength among BAT variables, VOCI-CTM, DPSS-R, and ACQ-R varied across conditions, with stronger correlations between BAT2 outcomes and VOCI-CTM evident in the control condition; however, due to discrepancies in sample size, the relationship between BAT2 anxiety change and VOCI-CTM is the only relationship that is significantly different across conditions ($p = 0.04$). Further, stronger correlations between BAT outcomes and ACQ-R scores were identified in the active (vs. control) condition, with the relationship between BAT1 anxiety change and ACQ-R significantly stronger ($p = .003$). Although correlations between BAT2 outcomes and ACQ-R were larger in the active condition, they were trending toward significance ($p = .09 - .11$) due to discrepancies in sample size. Stronger correlations between BAT1 outcomes and DPSS-R scores were also evident in the active condition; however, between condition differences were trending toward significance ($ps = 0.54 – 0.63$; see Tables 8 and 9).

The stronger correlations between BAT variables and VOCI-CTM in the control (vs. active) condition, particularly the moderate to strong positive correlations between anxiety change and VOCI-CTM, suggest contamination fears may have more of an impact on behavioral performance for this condition. That is, contamination fears may have a greater impact on
Table 6. Correlations Among Baseline Variables for Full Sample

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<th>6a</th>
<th>6b</th>
<th>6c</th>
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<td>.83*</td>
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</table>

Note. N = 81; *p < .01; †p < .05.
CTM = Vancouver Obsessive-Compulsive Inventory, contamination subscale; DPSS-R = Disgust Propensity and Sensitivity Scale – Revised; DPSS-R P = Disgust Propensity and Sensitivity Scale, propensity subscale; DPSS-R S = Disgust Propensity and Sensitivity Scale, sensitivity subscale; DCS = Desire of Control Scale; ACQR = Anxiety Control Questionnaire – Revised; EC = Anxiety Control Questionnaire – Revised, Emotion Control Subscale; TC = Anxiety Control Questionnaire – Revised, Threat Control Subscale; SC = Anxiety Control Questionnaire – Revised, Stress Control Subscale; BSQ = Beliefs of Self-Talk Questionnaire; STS = Self-Talk Scale; STS_C = Self-Talk Scale, self-criticism subscale; STS_R = Self-Talk Scale, self-reinforcement subscale; STS_S = Self-Talk Scale, social assessment subscale; STS_M = Self-Talk Scale, self-management subscale.
### Table 7. Correlations Among Baseline Variables by Condition

<table>
<thead>
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<th>Scale</th>
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<th>2a</th>
<th>2b</th>
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Note. *p < .01; ‡p < .05
Correlations for the Self-Talk condition (n = 42) are presented below the diagonal.
Correlations for the Coloring condition (n = 39) are presented above the diagonal.
CTM = Vancouver Obsessive-Compulsive Inventory, contamination subscale; DPSS-R = Disgust Propensity and Sensitivity Scale Revised; DCS = Desire of Control Scale; ACQR-pre = Anxiety Control Questionnaire – Revised at baseline; BSQ = Beliefs of Self-Talk Questionnaire; STS = Self-Talk Scale
Table 8. Correlations Among Outcome Variables (post-manipulation) by Condition

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<th>1c</th>
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*Note.* p < .01; *p < .05.

Correlations for the Self-Talk condition (n = 36-42 due to listwise deletion) are presented below the diagonal. Correlations for the Coloring condition (n = 18-39 due to listwise deletion) are presented above the diagonal. Questionnaire and BAT1 variables have maximum responses, responses to BAT2 outcomes are varied; no one from the self-talk questionnaire refused or prematurely discontinued BAT1, therefore there is no variation in the “BAT1_refuse” variable for this condition. ACQR_post = Anxiety Control Questionnaire – Revised post-manipulation; EC = Anxiety Control Questionnaire – Revised, emotion control subscale; TC = Anxiety Control Questionnaire – Revised, threat control subscale; SC = Anxiety Control Questionnaire – Revised, stress control subscale; BSQ = Beliefs of Self-Talk Questionnaire, post-manipulation; FSTQ = Functions of Self-Talk Questionnaire; FSTQ_CF = Functions of Self-Talk Questionnaire, confidence-belief subscale; FSTQ_EF = Functions of Self-Talk Questionnaire, effort-motivation subscale; FSTQ_CT = Functions of Self-Talk Questionnaire, cognitive- affective control subscale; BATstep = level of engagement with BATs; BAT1_refuse = categorical engagement variable for BAT1; BAT1_min = time spent engaged with BAT1 until habituation or discontinue; BAT1_AC = percent anxiety change from pre- to post- BAT1; BAT2_refuse = categorical engagement variable for BAT2; BAT2_min = time spent engaged with BAT2 until habituation or discontinue; BAT2_AC = percent anxiety change from pre- to post- BAT2; NeutUrge = Neutralization Urge reported following behavioral task completion.
### Table 9. Correlations Between Baseline and Outcome Variables by Condition

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<th>Control: Coloring (n = 18-39)</th>
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Note: †p < .01; *p < .05.

Variations in ns due to listwise deletion; questionnaire and BAT1 variables have maximum responses, responses to BAT2 outcomes are varied.

**Horizontal Axis Variables (collected at baseline):** CTM = Vancouver Obsessive-Compulsive Inventory, contamination subscale; DPSS-R = Disgust Propensity and Sensitivity Scale – Revised; DCS = Desire of Control Scale; ACQR = Anxiety Control Questionnaire – Revised; BSQ = Beliefs of Self-Talk Questionnaire; STS = Self-Talk Scale.

**Vertical Axis Variables (collected post-manipulation):** ACQR_post = Anxiety Control Questionnaire – Revised post-manipulation; BSQ = Beliefs of Self-Talk Questionnaire, post-manipulation; FSTQ = Functions of Self-Talk Questionnaire; FSTQ_CF = Functions of Self-Talk Questionnaire, confidence-belief subscale; FSTQ_EF = Functions of Self-Talk Questionnaire, effort-motivation subscale; FSTQ_CT = Functions of Self-Talk Questionnaire, cognitive and emotional control subscale; BATstep = level of engagement with BATs; BAT1_refuse = categorical engagement variable for BAT1; BAT1_min = time spent engaged with BAT1 until habituation or discontinue; BAT1_AC = percent anxiety change from pre- to post- BAT1; BAT2_refuse = categorical engagement variable for BAT2; BAT2_min = time spent engaged with BAT2 until habituation or discontinue; BAT2_AC = percent anxiety change from pre- to post- BAT2.
anxiety change for individuals who did not complete the positive self-talk intervention. The pattern of correlations between BAT variables and ACQ-R in the active condition suggest a stronger relationship among sense of control, time to habituation, and percent anxiety change in individuals who used self-talk as compared to those who did not. Specifically, ACQ-R scores were significantly inversely related with time to habituation and significantly positively related to percent anxiety change.

Whereas the correlations between BAT and each VOCI-CTM and ACQ-R were consistent with expectations, the relationship between BAT and DPSS-R in the active condition was not. DPSSR and CTM correlations both were moderate in the active condition, with DPSSR correlations slightly higher; however, the unexpected finding was the discrepancy (albeit non-significant) between these scores in the control condition. In this condition, BAT and VOCI-CTM correlations were moderate to strong, whereas BAT and DPSSR correlations were low. It was expected that patterns of significance between BAT and DPSS-R variables would more closely mirror the relationship between BAT and VOCI-CTM variables across conditions.

**Baseline differences across conditions.** A series of one-way ANOVAs was conducted to compare baseline scores on variables expected to be related to dependent variables. As expected, due to the method of condition assignment, one-way ANOVAs confirmed baseline scores were similar across conditions on the following variables: age, gender, contamination scores, belief in self-talk, self-talk usage, sense of control, desirability of control, and disgust sensitivity and propensity (see Table 1). Therefore, covariates were not used in the primary analyses.
Primary Data Analyses

A one-way MANOVA was used to assess the first series of hypotheses and examine self-talk usage and relative impact on confidence and motivation across conditions. A significant multivariate effect was found, indicating that the self-talk and coloring conditions differed significantly on a linear combination of the three dependent variables ($F(3, 77) = 5.08; p = .003; d = .90$). Follow-up univariate analysis indicated the two conditions differed significantly on self-talk usage ($F(1, 79) = 10.6; p = .002; d = .75$), confidence in ability to use positive self-talk ($F(1, 79) = 4.25; p = .04; d = .47$), and increased motivation as a result of self-talk usage ($F(1, 79) = 5.18; p = .03; d = .52$). Participants in the active condition displayed significantly higher instances of self-talk usage ($M = 13.0$ vs. $4.7$), confidence in their ability to use positive self-talk ($M = 3.5$ vs. $3.1$), and motivation to complete the behavioral task ($M = 26.0$ vs. $22.4$; FSTQ Effort-Motivation subscale) compared to the control condition. These findings are in the expected direction, are indicative of manipulation success, and yield support for Hypotheses 1a-1c.

A second one-way MANOVA was conducted to assess Hypothesis 2a and examine the effectiveness of individuals’ self-talk usage on self-reported sense of control after engaging in a feared situation. A significant multivariate effect was found, indicating that the conditions differed significantly on a linear combination of the dependent variables ($F(2, 78) = 4.27; p = .02; d = .66$). Follow-up examination of univariate analysis indicated the two conditions differed significantly on the FSTQ Cognitive and Emotional Control subscale ($F(1, 79) = 5.53; p = .02; d = .53$), but not change in ACQ-R scores from pre- to post-intervention ($F(1, 79) = 2.27; p = .14; d = .24$). Participants in the active condition (vs. control) reported significantly higher scores on the
FSTQ Cognitive and Emotional Control subscale ($M = 23.6$ vs. $20.0$), as well as greater (albeit not a statistically significant) change in ACQ-R scores from pre- to post-intervention ($M = 11.9$ vs. $9.6$).\(^1\) These findings are in the expected direction and provide partial support for Hypothesis 2a.

A one-way ANOVA was used to examine how much control individuals exhibited on reducing compensatory or neutralizing urges after engaging in the behavioral task. Results indicated the two conditions differed significantly on Neutralization scores ($F_{(1, 79)} = 4.71; p = .03; d = .49$), with the active condition displaying a lower aggregate neutralization score ($M = 12.8$) than the control condition ($M = 14.9$). These findings are in the expected direction and support Hypothesis 2b.

Finally, to examine the impact of positive self-talk usage on both perceived confidence to engage with feared situations and actual engagement with contaminants, a one-way MANOVA was conducted utilizing behavioral task outcome variables. During the behavioral task, participants were free to refuse to engage in the task at any point. As a result, whereas all participants engaged with BAT1 to some degree, six participants from the coloring condition chose to discontinue the task prior to habituation or the pre-established 10-minute time limit had occurred. On BAT2, 27 participants refused to begin the task (six from the active self-talk condition, 21 from the coloring condition) and therefore are missing all BAT2 data beyond the anticipatory anxiety ratings. Only one participant began the task and chose to discontinue. Refusal rates were submitted to a chi-square analysis to increase understanding of the statistical

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\(^1\)Change score was calculated by subtracting pre-intervention scores from post-intervention scores; therefore, greater change is reflected by higher, positive values. On the ACQ-R, higher values equate to greater sense of perceived control.
nature of the refusal rates. Results indicated statistical significance ($\chi^2(1) = 14.24, p < .001$) with 14% from the active (self-talk) condition refusing engagement compared to 54% of individuals from the coloring (control) condition.

MANOVA analyses require listwise deletion of participants with missing data. Therefore, the statistically discrepant refusal rates described above resulted in the proposed analyses for Hypotheses 3a-3c to involve a reduced sample size ($N = 55$), uneven cell sizes (self-talk $n = 37$; coloring $n = 18$), and markedly decreased power (observed power = .29). These limitations contributed to a non-significant multivariate effect, indicating that the conditions did not differ significantly on time spent in BAT1 or BAT2, percent anxiety change pre- to post-task for BAT1 or BAT2, or scores on the FSTQ Confidence-Belief subscale ($F(5, 49) = 0.90; p = .49; d = .60$). Although the omnibus test was non-significant, examination of means indicated the data pattern was in the expected direction. That is, participants in the active condition reported greater confidence in their ability to approach feared situations ($M = 23.65$ vs. $M = 21.33$); spent less time in the BATs, indicating faster habituation for BAT1 ($M = 5.14$ minutes vs. $M = 6.22$ minutes) and BAT2 ($M = 4.15$ minutes vs. $M = 6.00$ minutes); and displayed greater anxiety change in BAT1 ($M = 51\%$ vs. $M = 41\%$) and BAT2 ($M = 54.7\%$ vs. $M = 47\%$). Again, the pattern of results was in the expected direction, but strong support for Hypotheses 3a-3c was not found due to the non-significant MANOVA.
Exploratory Analyses

Although refusal to engage in BAT2, particularly following engagement with BAT1, is meaningful information, the potential impact of positive self-talk on behavioral task performance may have been obscured by reduced power. Therefore, to capture a better understanding of this relationship, two adequately powered exploratory analyses were conducted. Because all participants engaged to some degree with BAT1 (and therefore are not missing data on any outcome variables), a MANOVA was conducted using the FSTQ Confidence-Belief subscale and BAT1 outcome as dependent variables. Eliminating BAT2 outcome resulted in the examination of the full sample ($N = 81$), roughly equivalent cell sizes (self-talk $n = 42$; coloring $n = 39$), and observed power of .90. Under these conditions, a significant multivariate effect was found and indicates that the conditions differed significantly on a linear combination of the dependent variables ($F(3, 77) = 3.85; p = .01; d = .77$). Univariate follow-up tests indicated the two conditions differed significantly on the FSTQ Confidence-Belief subscale ($F(1, 79) = 6.99; p = .01; d = .59$) and percent anxiety change ($F(1, 79) = 5.49; p = .02; d = .53$), but not on the amount of time spent completing the behavioral task ($F(1, 79) = 1.63; p = .21; d = .29$). Compared to the control condition, participants in the active condition reported higher levels of confidence on the FSTQ ($M = 23.9$ vs. $19.5$), nearly double the percent change of anxiety scores from pre- to post-BAT1 ($M = 44.1\%$ vs. $22.1\%$), and faster habituation ($M = 5.5$ minutes vs. 6.5 minutes); however, the time difference was non-significant. If Hypotheses 3a-3c only examined data from BAT1 instead of BAT1 and BAT2, Hypotheses 3b and 3c would have been supported.
The second exploratory analysis conducted was an examination of the originally proposed MANOVA using imputed data. That is, all participants who refused to engage with BAT2 were assigned the maximum time for habituation (i.e., 10 minutes). All data for FSTQ and BAT1 are the same as described above; however, the imputation allows for further examination of BAT2 data. A significant multivariate effect was found and indicates that the conditions differed significantly on a linear combination of the dependent variables \( F(5, 75) = 4.52; p = .001; d = 1.10 \). Univariate follow-up tests indicated the two conditions differed significantly on confidence to engage with feared situations as measured by the FSTQ \( F(1, 79) = 6.99; p = .01; d = .59 \), percent anxiety change for BAT1 \( F(1, 79) = 5.49; p = .02; d = .53 \) and BAT2 \( F(1, 79) = 16.41; p < .001; d = .91 \), and time until habituation for BAT2 \( F(1, 79) = 17.46; p < .001; d = .94 \) but not for BAT1 \( F(1, 79) = 1.63; p = .21; d = .29 \).

\[ ^2 \text{For data recording purposes, individuals who refused to engage with BAT2 were assigned a value of 601s (vs. 600s). This coding scheme allowed for easy distinction between assigned values and participants who engaged for the full 600s but did not habituate.} \]
CHAPTER 5

DISCUSSION

Existing research has shown that maladaptive beliefs about control, including sense of control, have been implicated in compulsive rituals and avoidance and may contribute to the etiology and maintenance of OCD (Moulding & Kyrios, 2006). Further, maladaptive control-related beliefs may make it particularly difficult for individuals to relinquish control and experience elevated levels of anxiety and distress necessary for successful ERP. Given this difficulty, it is important to identify ancillary interventions that assist patients with yielding control. Literature suggests positive self-talk as one technique that may help with successful yielding of control; however, research on self-talk within the anxiety and OCD literatures is limited, with a significant portion dedicated to decreasing negative self-talk, not increasing positive self-talk.

The current study sought to address some of the limitations in the existing literature, including lack of positive self-talk interventions for adults with OC symptoms and inconsistent content within self-talk interventions. Broadly, the current study aimed to adapt methods and translate findings from the sports psychology literature to the OCD literature, thereby contributing to the understanding of the impact of positive self-talk on control-related beliefs and engagement with feared stimuli in individuals with contamination concerns. Specifically, the present work sought to contribute to the links between a positive self-talk intervention on multiple symptom presentations related to OCD (e.g., sense of control, engagement with feared stimuli, and reduction of automatic or compulsive responses).
Summary and Interpretation of Study Findings

Aim 1: Effectiveness of self-talk manipulation. Despite the use of self-talk interventions with children experiencing anxiety and OCD (e.g., Kendall, 1990; March & Mulle, 1998), few attempts to assess self-talk in adults exist, and those that do exhibit limitations. As such, a novel experimental manipulation modified from the sports psychology literature was implemented to assess the study’s hypotheses. As previously reviewed, the sports psychology literature supports the use of positive, motivational, brief, overt self-statements that are self-selected by participants, parameters utilized in the design of the current intervention. Studies utilizing positive, motivational self-talk interventions following these guidelines in the sports psychology literature report positive benefits, including decreased anxiety, increased motivation, and increased self-confidence (Hardy, 2006; Tod et al., 2011). The intervention in the current study displayed similar benefits, with participants who completed the self-talk intervention utilizing positive self-talk more frequently, reporting more confidence in their ability to use positive self-talk, and reporting higher levels of motivation than participants who did not. These findings indicate the novel, positive, motivational self-talk manipulation was successful and targeted expected areas. Although findings are preliminary and require further exploration, this study provides an important first step in translating motivational self-talk interventions from sport psychology to clinical psychology.

Aim 2: Impact of self-talk manipulation on control-related beliefs. Control-related beliefs have been implicated in the etiology and maintenance of OC symptoms; however, these
beliefs are not commonly addressed in CBT/ERP treatments. As such, researchers have recommended that future studies address difficulty yielding control—a barrier to treatment engagement—as an adjunct to stand-alone ERP (Moulding & Kyrios, 2006, 2007). The current study aimed to identify the utility of a positive self-talk manipulation on individuals’ ability to positively yield control, as measured by self-reported sense of control and level of emotional/cognitive control. Positive motivational self-talk has been identified as a positive strategy of yielding control and has shown to increase athletes’ sense of control and decrease cognitive anxiety in the sports psychology literature (Hatzigeorgiadis et al., 2009).

Again, findings similar to the sports psychology literature emerged in the current study. Participants who completed the positive self-talk intervention reported significantly higher levels of cognitive and emotional control as a result of their use of self-talk. That is, they endorsed feeling more calm, being less impacted by negative thoughts, and experiencing less anxiety than individuals who did not complete the self-talk intervention. When examining change of sense of control or perception of control over external situations, from baseline to post-assessment, individuals who completed the self-talk intervention reported an increase in their sense of control, but not significantly more so than individuals who did not complete the intervention. A possible explanation for this finding may be a function of the behavioral task.

Completion of the BAT may have provided participants with corrective information about their fears. That is, participants may have learned feared consequences associated with their anxiety did not materialize following their engagement with a feared situation, and/or they were able to successfully manage the anxiety they experienced in a threatening situation (e.g., Foa & Kozak, 1986). Data patterns suggest ACQ-R scores significantly increased from baseline
to post-BAT within the self-talk \( t(41) = -11.63, p < .001 \) and coloring \( t(41) = -8.49, p < .001 \) conditions. It is possible that the corrective information received from the BAT could have increased sense of control across conditions, thereby inflating post-assessment scores and making the impact of the self-talk intervention less salient.

Extant literature also suggests positive yielding of control should negate the perceived need to engage in overcontrol behaviors such as neutralizing and rituals (Shapiro & Austin, 2007). This finding was observed in the current study. Compared to the control condition, individuals who completed the self-talk intervention reported fewer urges to neutralize (e.g., wash hands, use hand sanitizer, or other behaviors such as showering or cleaning fingernails) and increased confidence in their ability to resist these urges following engagement with contaminants. Although these findings are preliminary and further research is needed, replication of the current findings in a clinical sample may have significant clinical utility. Specifically, these results provide an early foundation for elucidating the benefits of a positive, motivational self-talk intervention as a potential adjunct to ERP for individuals who may struggle with neutralizing.\(^1\)

When completing exposure-based therapies, neutralizing anxiety during treatment by avoiding full engagement or with misattributions of safety (e.g., telling yourself you can wash your hands after touching contaminated objects) can negatively impact the process of habituation, which decreases the effectiveness of exposures (Parrish, Radomsky, & Dugas, 2008). Reducing urges to neutralize and increasing individuals’ confidence in their ability to resist the urges that do arise may result in greater treatment engagement and better treatment outcomes.

\(^1\)See pp. 97-98 for a potential limitation relevant to this issue.
Aim 3: Impact of self-talk manipulation on behavioral performance. Existing research identifies ERP as the gold-standard treatment for OCD (Abramowitz et al., 2006); however, engaging in ERP may be particularly difficult for individuals with maladaptive control-related beliefs. In fact, experiencing heightened levels of distress associated with exposure therapies may be highly aversive for people who hold these beliefs, which increases the likelihood for lower treatment adherence and higher attrition rates (Moulding & Kyrios, 2006). Overall, research examining the impact of positive self-talk on anxiety and OCD is notably limited. Further, completed research largely focuses on child and adolescent samples; the few studies that have been completed with adults with OCD report minimal success. Findings within the child literature suggest children who engage in positive self-talk while completing exposures were better able to remain in feared situations until habituation occurred. As such, positive self-talk may be a viable option for individuals who otherwise would be unwilling or unable to tolerate exposure-related distress (Franklin et al., 2006).

Prior to this study, the above finding had not been replicated in an adult sample with OC symptoms. However, current results suggest engaging in the self-talk intervention significantly increased the likelihood participants would complete both portions of the behavioral task. Across conditions, all participants engaged in BAT1 to some degree, which required them to touch a predetermined contaminant with two hands, one hand, one finger, or through a tissue. However, individuals who completed the self-talk intervention (vs. those who did not) were two and a half times more likely to complete the second portion of the behavioral task, which included touching their face with the contaminated part of their hand/tissue. Further, when examining BAT1 independent of BAT2, results indicated individuals who completed the self-talk intervention
reported significantly greater anxiety change and increased confidence in their ability to engage with feared situations. Time to habituation was not significantly different across conditions, but participants who completed the self-talk intervention habituated 1 minute faster on average. Given the statistically discrepant refusal rates between conditions on BAT2, statistical power was markedly lower when examining BAT1 and BAT2 outcomes concurrently. Although results were non-significant, the pattern of findings converge with those found when examining BAT1 independently. That is, participants who completed the self-talk intervention displayed greater anxiety change, reported greater confidence in their ability to approach feared situations, and habituated more quickly for both phases (on average, 1 minute faster for BAT1 and 1 minute 45 seconds faster for BAT2).

Although preliminary and limited by inadequate power, these results provide a promising basis for future studies. Specifically, successful replication with adequate power may yield further support for the use of the novel self-talk intervention as a possible adjunct to exposure-related therapies. Similar to findings in the sports psychology literature and in child samples with OCD, current results suggest a positive self-talk intervention may result in individuals engaging more fully with feared situations, resulting in greater anxiety change and less time to habituation, thereby possibly increasing the likelihood of a successful exposure. As mentioned, when exposures are successfully completed and habituation occurs, individuals are provided with corrective information related to their fears (Foa & Kozak, 1996). This corrective information, paired with the motivational nature of self-talk, likely work in conjunction to increase confidence in one’s ability to approach feared situations in the future.
Limitations and Future Directions

This study is strengthened by the use of an experimental approach to assess the influence of positive self-talk on control beliefs and engagement with feared stimuli. Questionnaire studies, albeit useful, do not allow for the assessment of causal relationships. As such, this study opted to employ an experimental approach to examine the impact of the novel self-talk intervention. The design was successful and allowed for conclusions regarding condition differences on outcome variables, including the in vivo contamination-related BAT. Nonetheless, the study had several limitations.

The use of an undergraduate sample with subclinical levels of OC concerns indicates the current results should be considered preliminary until replicated in a clinical sample. Further, results of this study are not necessarily generalizable to those diagnosed with OCD. It is unknown if individuals with a formal diagnosis of OCD would respond differently to the use of the motivational positive self-talk intervention during ERP or if they would find the intervention to be as beneficial as would individuals with less severe symptoms. It is likely that the degree of obsessive thought and mental ritualizing is much higher in individuals with clinical symptoms. As such, these individuals may require more mental effort to complete a positive self-talk intervention, which could make it more difficult, more distracting, more frustrating, and/or less efficient. Therefore, potential therapeutic benefit per se of the developed intervention cannot reasonably be determined using the current sample.

A procedural decision that may have impacted the study outcomes and generalizability of findings was the use of individuals with OC concerns specific to contamination. This decision
was made for logistical reasons: (1) restricting the sample to those with contamination concerns allowed for the use of a standardized behavioral task and clear measurement of potential neutralization urges related to washing and cleaning behaviors and (2) elevated contamination concerns are present within an undergraduate population allowing for the recruitment of a large enough sample to adequately power the planned analyses. Although useful given the early stages of the research, restricting the sample to individuals with contamination concerns may impact the generalizability of the findings. Specifically, the findings may generalize more readily to individuals who identify clinically significant contamination concerns compared to those with clinical levels of OCD symptoms consistent with other (possibly multiple) symptom dimensions. One reason for this may be the content of compulsive rituals. Individuals who have contamination concerns often report engaging in physical washing compulsions. However, individuals experiencing symptoms consistent with other OCD subtypes may display significantly more mental rituals, which have the potential to interfere with individuals’ ability to use positive self-talk.

A second procedural decision that may have impacted study outcomes was the single-blind study design. Allowing research assistants to be aware of participant conditions may have increased the likelihood of experimenter bias. Specifically, although the study protocol was scripted and research assistants were explicitly trained not to deviate from the provided script, it is possible that nonverbal interactions or other cues performed by the researcher may have influenced the participants’ engagement during the behavioral task. Given the possible impact of study design on current outcomes, it is recommended that future studies replicate this study using a double-blind design. A final procedural decision that may have impacted study outcomes was
the use of the BPM, a measure developed for the current study. An existing measure capturing all necessary constructs related to the BAT was not available for use prior to the completion of this study. As such, the BPM was developed to gather information about individuals’ experiences in the specific BAT utilized in this study but was not piloted or normed prior to data collection. The neutralization subscale embedded within the BPM was used as a primary outcome measure and displayed adequate psychometric properties in the current sample. Further, although not directly related to outcome variables, the scale’s 18 quantitative items (vs. qualitative, fill-in items) displayed modest but adequate internal consistency in the current sample. Thus, although normed measures are preferred, the BPM appeared to demonstrate acceptable reliability.

Another limitation—specific to consideration of null effects—is the insufficient power for analyses involving the BAT2 outcome variables. As discussed, significantly more individuals from the coloring condition refused to engage with BAT2, which resulted in unequal cell sizes and limited power. The elevated refusal rate was not anticipated, and therefore a priori hypotheses related to this finding were not generated. As such, data were analyzed without the individuals who refused, resulting in non-significant differences with means in the predicted direction and medium effect size estimates. In an effort to address the null findings and analyze data from the full sample, exploratory analyses were completed with imputed data used for individuals who refused engagement. As mentioned, an a priori decision on how to code a data point for individuals who refused was not made; therefore, all participants who refused to engage with BAT2 were assigned the maximum time for habituation. Whereas this solution allowed data for the full sample to be analyzed, outcomes for BAT2, particularly the time to habituation variable, may have been inflated. Given the current findings, it is recommended future studies
consider forming a priori hypotheses utilizing attrition rates as a dependent variable. If BAT attrition is not utilized as a dependent variable, the study design may require more participants to account for attrition and to detect significant differences among conditions.

One potential concern that could impact the utility of the current findings was the possibility of self-talk serving as a distraction and neutralizing anxiety during the behavioral task. Although the sports psychology literature suggests the use of brief statements (i.e., one to four words) increases concentration and focus, it was unclear whether this would translate to an intervention to be used with individuals with OC symptoms. Specifically, if the use of positive self-talk distracted from the task at hand or reduced anxiety artificially or prematurely, thereby negatively impacting the process of habituation, it would not serve as a useful intervention. A literature review conducted by Parrish and colleagues (2008) indicated anxiety control strategies utilized by individuals during exposures were less likely to negatively impact treatment outcomes and be viewed as counterproductive if one or more of the following were true of the strategy: (1) it promotes increased self-efficacy, (2) it enables approach behavior and integration of corrective information, (3) it does not promote or provide misattributions of safety, and (4) it does not require excessive attentional resources and/or increase cognitive load excessively.

Based on these guidelines, even if participants interpreted the positive self-talk intervention as a safety behavior or other anxiety control strategy, the intervention is unlikely to negatively impact engagement with feared situations by distracting participants or artificially reducing anxiety. That is, in the current study, the novel, positive self-talk intervention (1) increased feelings of self-confidence (self-efficacy), as evidenced by participants in the active condition reporting greater levels of self-confidence; (2) enabled approach behavior, as
evidenced by two and half times more participants in the active condition (vs. control) completing BAT2; (3) was highly unlikely to increase feelings of safety because the content of the self-talk was unrelated to the behavioral task; and (4) was brief in nature and therefore was designed to increase concentration and focus, not increase cognitive load and distract from the task. Although not directly related to an aim of the study, information regarding participants’ perception of the mental effort required to complete the positive self-talk intervention was collected. Overall, a majority of participants who completed the intervention (62%) did not feel it required mental effort. Additional research comparing the current self-talk intervention to an intervention requiring increased attentional resources (e.g., an intervention with longer phrases) may prove useful for further understanding the benefits of such interventions.

Limitations notwithstanding, the present study provides a foundation upon which future studies can build. Future studies could examine the effectiveness of the self-talk intervention on control-related beliefs and engagement with feared scenarios in other OC symptom dimensions (e.g., checking) to determine potential benefits. Additionally, future studies could assess the utility of the self-talk intervention in a clinical sample to assess the potential therapeutic benefit of the intervention. Completing a study with a clinical sample also may elucidate (1) the potential impact of positive, motivational self-talk as an anxiety control strategy and (2) the positive (or negative) impact of self-talk on habituation and receiving corrective information during exposures.

Unfortunately, as a preliminary experiment examining a novel self-talk intervention, the current study incorporated relatively few outcome variables and utilized simple models. However, given the positive outcomes in the current study, future research examining potential
mechanisms that contribute to the success of the positive self-talk intervention would help to advance this literature. As mentioned, contemporary self-talk theories offer various mechanisms as pathways through which self-talk may be effective, including self-efficacy and focusing of attention. Relevant to the current study, it may be that positive self-talk leads to increased task engagement, but only through increased self-efficacy. Study findings identified that participants who utilized positive self-talk reported increased self-confidence compared to those who did not, but change in self-efficacy for participants in the active condition was not measured—nor was the impact of baseline self-efficacy on usage of positive self-talk. Completing this or related studies would increase knowledge regarding the interventions’ utility. Moreover, understanding the mechanisms through which positive self-talk is effective could help to identify which patients would experience the most benefits from the interventions.

Conclusions

Although further research is needed to replicate and extend the current findings, the present study suggested a motivational, positive self-talk intervention may be effective in assisting individuals with yielding control and increasing engagement with a feared situation. This study provided novel information regarding the use of and benefits associated with positive self-talk in an adult sample with OC symptoms. Whereas future studies with clinical samples and individuals with symptoms associated with other targeted OCD symptoms are needed, these preliminary findings provide a foundation for further assessment of the utility of positive self-talk as a possible adjunct intervention to be used with exposure-based therapies for adult clients.
REFERENCES


Tod, D., Hardy, J., & Oliver, E. (2011). Effects of self-talk: A systematic review. *Journal of Sport and Exercise Psychology, 33*(5), 666-687. [http://dx.doi.org/10.1123/jsep.33.5.666](http://dx.doi.org/10.1123/jsep.33.5.666)


Contamination Screening

All Ss continued, those with scores \( \geq 14 \) were retained for analyses

Pre-assessment questionnaire battery

Ss without OCD diagnosis continued

Ss with OCD diagnosis debriefed & dismissed

Assignment \((n = 42)\) to Experimental Condition

Positive self-talk psychoeducation & practice

Assignment \((n = 39)\) to Control Condition

Coloring psychoeducation & practice

Behavioral Approach Tasks

Post-assessment questionnaire battery

Debrief & dismiss
APPENDIX B

MEASURE PERMISSIONS
Permissions

• Permission was granted to my advisor, Dr. Kevin Wu, and his research lab for the Obsessive-Compulsive Inventory – Revised.

• Permission was sought from author and granted (for no cost) for the following measures:
  1. The Vancouver Obsessional Compulsive Inventory (VOCI),
  2. The Disgust Propensity and Sensitivity Scale – Revised (DPSS-R),
  3. Functions of Self-Talk Questionnaire (FSTQ),

• The following measures are posted online and available for use (at no cost) to all researchers:
  1. The Center for Epidemiologic Studies Depression Scale (CES-D); retrieved from www.midss.org).
  2. The Desire for Control Scale (DC); retrieved from www.midss.org).
  3. Beliefs in Self-Talk Questionnaire (BSQ); full scale published in journal, able to use without permissions for dissertation purposes.
APPENDIX C

STUDY SCREENING FORM
Please rate each statement by putting a circle around the number that best describes how much the statement is true of you. Please answer every item, without spending too much time on any particular item.

<table>
<thead>
<tr>
<th>How much is each of the following statements true of you?</th>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Much</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel very dirty after touching money.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I use an excessive amount of disinfectants to keep my home or myself safe from germs.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I spend far too much time washing my hands.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Touching the bottom of my shoes makes me very anxious.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I find it very difficult to touch garbage or garbage bins.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I am excessively concerned about germs and disease.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I avoid using public telephones because of possible contamination.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I feel very contaminated if I touch an animal.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I am very afraid of having even slight contact with bodily secretions (blood, urine, sweat, etc.).</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. One of my major problems is that I am excessively concerned about cleanliness.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I often experience upsetting and unwanted thoughts about illness.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. I am afraid to use even well-kept public toilets because I am so concerned about germs.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Please answer the questions below by putting a circle around the letter next to the answer that is most true for you.

13. Are you allergic to cats?
   A. Yes
   B. No
   C. Unsure

14. Have you received a diagnosis of Obsessive-Compulsive Disorder (OCD)?
   A. Yes
   B. No

15. If you have ever received a diagnosis of OCD, please indicate if the diagnosis is current, or if your symptoms are in remission. If you have not been diagnosed with OCD, please mark ‘C – Not Applicable’.
   A. Current diagnosis
   B. Past diagnosis – symptoms are in remission
   C. Not Applicable
APPENDIX D

ANXIETY CONTROL QUESTIONNAIRE – REVISED
Anxiety Control Questionnaire – Revised

Listed below are a number of statements describing a set of beliefs. Please read each statement carefully and, on the 0 to 5 scale below, indicate how much each you agree with each statement right now.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Moderately Disagree</td>
<td>Slightly Disagree</td>
<td>Slightly Agree</td>
<td>Moderately Agree</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>1.</td>
<td>How well I cope with difficult situations depends on whether I have outside help.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>When I am put under stress, I am likely to lose control.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>When I am frightened by something, there is generally nothing I can do.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Whether I can successfully escape a frightening situation is always a matter of change with me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>I can usually put worrisome thoughts out of my mind easily.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>I am able to control my level of anxiety.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>There is little I can do to change frightening events.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>The extent to which a difficult situation resolves itself has nothing to do with my actions.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>If something is going to hurt me, It will happen no matter what I do.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>I can usually relax when I want.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>When I am under stress, I am not always sure how I will react.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Most events that make me anxious are outside my control.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>I usually find it hard to deal with difficult problems.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15.</td>
<td>When I am anxious, I find it hard to focus on anything other than my anxiety.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX E

DESIRABILITY OF CONTROL SCALE
Appendix E: Desirability of Control Scale
by expressing the extent to which you believe the statement applies to you. For all items, a
response from 1 to 7 is required. Use the number that best reflects your belief when the scale
is defined as follows:

1 = The statement does not apply to me at all
2 = The statement usually does not apply to me
3 = Most often, the statement does not apply
4 = I am unsure about whether or not the statement applies to
me, or it applies to me about half the time
5 = The statement applies more often than not
6 = The statement usually applies to me
7 = The statement always applies to me

1. I prefer a job where I have a lot of control over what I
do and when I do it. 1 2 3 4 5 6 7
2. I enjoy political participation because I want to have as
much of a say in running government as possible. 1 2 3 4 5 6 7
3. I try to avoid situations where someone else tells me
what to do. 1 2 3 4 5 6 7
4. I would prefer to be a leader than a follower. 1 2 3 4 5 6 7
5. I enjoy being able to influence the actions of others. 1 2 3 4 5 6 7
6. I am careful to check everything on an automobile
before I leave for a long trip. 1 2 3 4 5 6 7
7. Others usually know what is best for me. 1 2 3 4 5 6 7
8. I enjoy making my own decisions. 1 2 3 4 5 6 7
9. I enjoy having control over my own destiny. 1 2 3 4 5 6 7
10. I would rather someone else take over the leadership
role when I’m involved in a group project. 1 2 3 4 5 6 7
11. I consider myself to be generally more capable of
handling situations than others are. 1 2 3 4 5 6 7
12. I’d rather run my own business and make my own
mistakes than listen to someone else’s orders. 1 2 3 4 5 6 7
13. I like to get a good idea of what a job is all about before
I begin. 1 2 3 4 5 6 7
14. When I see a problem, I prefer to do something about it
rather than sit by and let it continue. 1 2 3 4 5 6 7
15. When it comes to orders, I would rather give them than receive them. 1 2 3 4 5 6 7
16. I wish I could push many of life’s daily decisions off on someone else. 1 2 3 4 5 6 7
17. When driving, I try to avoid putting myself in a situation where I could be hurt by another person’s mistake. 1 2 3 4 5 6 7
18. I prefer to avoid situations where someone else has to tell me what it is I should be doing. 1 2 3 4 5 6 7
19. There are many situations in which I would prefer only one choice rather than having to make a decision. 1 2 3 4 5 6 7
20. I like to wait and see if someone else is going to solve a problem so that I don’t have to be bothered with it. 1 2 3 4 5 6 7
APPENDIX F

FUNCTIONS OF SELF-TALK QUESTIONNAIRE
Appendix F: Functions of Self-Talk Questionnaire

This questionnaire is designed to examine your opinions about internal thoughts you had while completing the previous behavioral activities. People often talk to themselves while they are completing challenging activities. Sometimes this dialogue is audible, yet usually individuals talk to themselves covertly, or inside their heads. Please use the rating scale below to answer the following questions about your self-talk during the past activity. Assume that each item begins with the statement: “When I used self-talk during the previous tasks…” Please read each statement carefully, and then choose the correct response for you by circling the appropriate number. If you did not use self-talk, answer *not at all* for the questions.

1  2  3  4  5  6  7

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Very much</th>
</tr>
</thead>
</table>

When I used self-talk during the previous tasks…

1. I felt more certain of myself
2. I acted impulsively
3. I maintained high levels of effort
4. I felt more relaxed
5. I concentrated on what I was doing at the moment
6. I felt more confident in my abilities
7. I executed behaviors automatically
8. I kept trying my best
9. I reduced my feelings of nervousness
10. I concentrated better on the execution of my behaviors
11. I felt stronger
12. I completed the task as if I was on auto pilot
13. I became more engaged with the task
14. I let go of my anxiety
15. I directed my attention to the task efficiently
16. I boosted my confidence
17. I increased my motivation
18. I tried harder
19. I interrupted negative thoughts I was having
20. I stayed focused on the task
21. I psyched myself up
22. The execution of the task became more automatic
<table>
<thead>
<tr>
<th></th>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.</td>
<td>I increased my effort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I stayed calm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I concentrated on what I had to do</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G

BAT PERFORMANCE MEASURE
Appendix G: BAT Performance Measure

1. How many times did you use *positive self-talk* during the behavioral task (write #): ______

2. How many times did you use *negative self-talk* during the behavioral task (write #): ______

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at All</th>
<th>Rarely</th>
<th>Some</th>
<th>Often</th>
<th>Most of the task</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. How frequently did you talk to yourself out loud?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. How frequently did you talk to yourself in your head?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. What did you say to yourself during the task (write answers on provided line)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_______________________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How well do you understand how to use positive self-talk?</td>
<td>Unsure</td>
<td>Not at All</td>
<td>Slightly</td>
<td>Moderately</td>
<td>Very Much</td>
</tr>
<tr>
<td>7. How confident are you in your ability to use positive self-talk in the future?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Did self-talk help to control your anxiety?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Did your use of self-talk help you to stay engaged with the contaminant longer?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. How contaminated do you feel after completing the behavioral task?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. How strongly do you feel the need to neutralize or “undo” the contamination on your hands?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. How strongly do you feel the need to neutralize or “undo” the contamination on your face?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. How strong of an urge do you feel to wash your hands?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. How strong of an urge do you feel to wash your face?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
15. How strong of an urge do you feel to use hand sanitizer?
   None  Slightly  Moderately  Strong  Very Strong
   0  1  2  3  4

16. How strong is your concern that if you do not neutralize something bad will happen (e.g., you will get sick)?
   None  Slightly  Moderately  Strong  Very Strong
   0  1  2  3  4

17. How strong of an urge do you feel to neutralize or “undo” the contamination on your hands or face in a way not asked about above?
   None  Slightly  Moderately  Strong  Very Strong
   0  1  2  3  4

   17a. If you answered a 1 or higher, please list what action or behavior you have the urge to complete:

   _______________________________________________________________

18. How confident are you that you can resist the urge to wash your hands, use sanitizer, or complete another behavior to reduce anxiety and/or remove contaminants?
   Unsure  Not at All  A little  Moderately  Very
   0  1  2  3  4

19. Did you complete any neutralizing behaviors or behaviors designed to reduce any anxiety you felt?
   No  Yes
   0  1

   19a. If yes, please list the behaviors here:

   _______________________________________________________________

20. If you used self-talk during the task, did you think it was helpful?
   No  Yes
   0  1  I didn’t use self talk

   20a. If you found it helpful, please tell us why it helped or what it did for you.

   _______________________________________________________________

   20b. If you did not find it helpful, please tell us why you think that was.
APPENDIX H

SELF-TALK SCALE
Appendix H: Self-Talk Scale

Researchers have determined that all people talk to themselves, at least in some situations or under certain circumstances. Each of the following items concerns those times when you might “talk to yourself” or carry on an internal conversation with yourself (either silently or out loud).

Determine how true each item is for you personally by circling the appropriate number next to each item. Assume that each item begins with the statement: “I talk to myself when...” Be sure to rate each item. Please take your time and think carefully about each item. Use the following scale to rate each item:

1              2                3                  4                5
Never     Seldom    Sometimes   Often   Very Often

I TALK TO MYSELF WHEN...

1. I should have done something differently
   1 2 3 4 5

2. Something good has happened to me
   1 2 3 4 5

3. I need to figure out what I should do or say
   1 2 3 4 5

4. I’m imagining how other people respond to things I’ve said
   1 2 3 4 5

5. I am really happy for myself
   1 2 3 4 5

6. I want to analyze something that someone recently said to me
   1 2 3 4 5

7. I feel ashamed of something I’ve done
   1 2 3 4 5

8. I’m proud of something I’ve done
   1 2 3 4 5

9. I’m mentally exploring a possible course of action
   1 2 3 4 5

10. I’m really upset with myself
    1 2 3 4 5

11. I try to anticipate what someone will say and how I’ll respond to him or her
    1 2 3 4 5

12. I’m giving myself instructions or directions about what I should do or say
    1 2 3 4 5

13. I want to reinforce myself for doing well
    1 2 3 4 5

14. Something bad has happened to me
    1 2 3 4 5

15. I want to remind myself of what I need to do
    1 2 3 4 5

16. I want to replay something that I’ve said to another person
    1 2 3 4 5
APPENDIX I

BELIEF IN SELF-TALK QUESTIONNAIRE
Appendix I: Belief in Self-Talk Questionnaire

For each of the following statements indicate the extent to which you disagree or agree by circling a number to the right.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Moderately Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Moderately Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I believe that my positive thoughts really help me to concentrate on a task.  
   0 1 2 3 4 5
2. I believe that my negative thoughts can directly hurt my performance.  
   0 1 2 3 4 5
3. I believe that my positive thoughts can lead to a good performance.  
   0 1 2 3 4 5
4. I believe that my negative thoughts can break my concentration.  
   0 1 2 3 4 5
5. My belief in my ability to do a task will help to improve my performance.  
   0 1 2 3 4 5
6. I believe that my negative thoughts can increase my anxiety about a task.  
   0 1 2 3 4 5
7. I believe that my positive thoughts will relax me enough to perform well.  
   0 1 2 3 4 5
8. I believe that doubting my ability to do a task hurts my performance.  
   0 1 2 3 4 5
APPENDIX J

DISGUST PROPENSITY AND SENSITIVITY SCALE - REVISED
Appendix J: Disgust Propensity and Sensitivity Scale - Revised

**Instructions:** this questionnaire consists of 12 statements about disgust. Please read each statement and think how often it is true for you, then circle the response option that is closest to this.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I avoid disgusting things.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>When I feel disgusted, I worry that I might pass out.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>It scares me when I feel nauseous.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>I feel repulsed.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Disgusting things make my stomach turn.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>I screw my face in disgust.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>When I notice that I feel nauseous, I worry about vomiting.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>I experience disgust.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>It scares me when I feel faint.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>I find something disgusting.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>It embarrasses me when I feel disgusted.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>I think feeling disgust is bad for me.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX K

DEMOGRAPHIC DATA QUESTIONNAIRE
Appendix K: Demographic Data Questionnaire

Instructions: Please answer the following questions by circling the letter corresponding to your choice or by writing your response.

1. What is your gender?
   a. Male
   b. Female
   c. Transgender
   d. Other

2. What is your current age? _________ years old

3. Are you right-handed, left-handed, or ambidextrous? _____________________

4. Are you allergic to cats?
   a. Yes
   b. No

5. What is your current marital status?
   a. Never Married
   b. Married
   c. Widowed
   d. Divorced
   e. Separated

6. Do you have children?
   a. Yes
   b. No

7. Do you have a job other than school?
   a. Yes, part-time
   b. Yes, full-time
   c. No

8. What is your race? Please circle all that apply
   a. Asian or Asian American
   b. Black or African American
   c. Native American
   d. White/Caucasian
   e. Multi-racial
   f. Other (please specify) ________________________________
9. Do you self-identify as Hispanic of Latino/Latina?
   a. Yes
   b. No

10. What is your religion?
    a. Buddhist
    b. Hindu
    c. Jewish
    d. Mormon
    e. Muslim
    f. Protestant
    g. Catholic
    h. Other (please specify) __________________________
    i. None

11. Have you ever been arrested for anything other than a motor vehicle violation?
    a. Yes
    b. No

12. Have you even been treated by a psychologist or psychiatrist for an emotional problem?
    a. Yes
    b. No

13. Are you currently in psychological or psychiatric treatment?
    a. Yes
    b. No

14. Please indicate which psychological disorders, if any, you have been diagnosed with:
    a. Generalized Anxiety Disorder
    b. Social Phobia
    c. Obsessive Compulsive Disorder
    d. Depression
    e. Bipolar Disorder
    f. Schizophrenia
    g. Other __________________________
    h. None
15. If you have ever received a diagnosis of OCD, please indicate if the diagnosis is current, or if your symptoms are in remission. If you have not been diagnosed with OCD, please mark ‘C – Not Applicable’.
   a. current diagnosis
   b. past diagnosis – symptoms are in remission
   c. Not Applicable

16. Are you currently taking medication for psychological or psychiatric treatment?
   a. Yes
   b. No

17. Please choose the statement that best describes your alcohol use:
   a. I have never used alcohol.
   b. I used to drink, but do not drink now.
   c. I drink socially but never to excess.
   d. I sometimes drink to the point of feeling “high”.
   e. I usually drink moderately, but will often drink more than I should.
   f. I often use alcohol to excess.
   g. I have had serious problems with my drinking.
   h. I consider myself an alcoholic.

18. Have you ever been treated for alcohol related problems?
   a. Yes
   b. No

19. Please choose the statement that best describes your drug use (any drug other than alcohol):
   a. I have never used drugs such as marijuana, cocaine, or barbiturates.
   b. I have used such drugs, but they have never been a problem for me.
   c. I have had problems with my use of such drugs.

20. Have you ever been treated for drug related problems
   a. Yes
   b. No
APPENDIX L

SELF-TALK PSYCHOEDUCATION FOR THE ACTIVE CONDITION
Appendix L: Self-Talk Psychoeducation

People often talk to themselves as they complete various activities throughout their day, especially when the activities are new or challenging in some way. When people talk to themselves, either out loud or by using a small voice inside their head, this is known as self-talk. Self-talk has been studied extensively in the sports psychology field, and research shows it can either help or hinder an individual’s performance. You will now learn more information about how you can use self-talk to your benefit, and stop using any self-talk that may be hurting your performance.

One of the most important factors that determines whether self-talk will help your performance is the valence—that is, whether you are saying positive or negative things to yourself. If you use positive self-talk, this means you are talking to yourself in a positive, motivating way intended to help you complete a task to the best of your ability. “You’re doing well!” or “Keep pushing!” are examples of positive self-talk people may use to motivate themselves and increase their performance. On the other hand, negative self-talk are statements similar to “I can’t” or “This is too hard.” These may hurt performance and increase negative emotions, such as anxiety.

Before you complete the next task in this study, you are asked to pick positive, motivational statements that you can say to yourself. As mentioned, these statements are designed to help motivate you and increase your performance ability. In addition to these benefits, research has shown that using positive, motivational statements can help to focus attention on the task at hand, increase concentration, increase confidence, and decrease anxiety. This is particularly true when someone is in a challenging, anxiety-provoking, or unfamiliar situation. For example, researchers have looked at the effect of positive self-statements used by children who were approaching situations or objects they feared. These studies have shown that using positive, motivational self-statements helped to increase the children’s engagement with the task, allowed them to remain in contact with the feared situation longer, and helped to reduce their feelings of anxiety. Similar research—that looked at the use of negative self-talk when people were in feared situations—has shown that negative self-statements actually increase anxiety, which makes the task more difficult.

One of our goals for this study is to teach you how to use positive, motivational self-talk, so you can use this tool to help you when in challenging situations. As mentioned, you will be given the opportunity to select two positive, motivational statements that you can say to yourself. After you select the statements, you will be asked to write them down multiple times and repeat them out loud to make yourself familiar with them. Later, when you are completing a different task, you should use these statements to help you increase your confidence and concentration, increase your motivation to succeed, and decrease anxiety. If you have any questions about positive self-talk, the associated benefits, or how to use it, please ask the researcher now.
APPENDIX M

SELF-TALK STATEMENTS FOR THE ACTIVE CONDITION
Appendix M: Self-Talk Statements

This sheet contains examples of positive, motivational statements that have shown to be effective in enhancing performance. Please select two of the below statements to use for the duration of the current study. If you feel as though none of the statements are appropriate for use, you may modify them to create a new statement with no more than four words.

1. I can.                        8. I am powerful!
2. Dig deep.                    9. I will!
4. Push through!                11. Let's go!
5. Keep going!                  12. I can do it!
6. Give more!                   13. I know I can!

Please indicate which two statements you selected by writing them below:

1. ________________________________

2. ________________________________
APPENDIX N

COLORING PSYCHOEDUCATION FOR THE CONTROL CONDITION
Appendix N: Coloring Psychoeducation

As children, many people enjoyed coloring images of their favorite characters, locations, or other scenes, using coloring books with crayons, markers, or colored pencils. Recently, coloring for adults has risen in popularity—in fact, coloring books top the New York Times® Bestseller List. The rise in popularity has led researchers to systematically study the benefits of coloring on people’s well-being. You will now learn more information about how you can use coloring to achieve positive outcomes.

One of the most important factors that determines whether coloring will be beneficial for you is the content, or what you choose to color. Various scenes or images have shown to have calming qualities, including geometric patterns known as mandalas. A mandala can be defined as any image that is represented within a circle. Because a circle can be perceived as both whole and uniform, it is seen to be a more calming shape than those with straight-edges or corners. In fact, both Eastern and Native American cultures view the circle as a meditative shape, and Buddhist monks draw mandala images in the sand for others to observe and use in meditation.

Before you complete the next task in this study, you will be asked to color a mandala for a short period of time. As mentioned, mandalas often have relaxing qualities. In addition to these benefits, research has shown that coloring mandalas can help to focus attention and decrease anxiety. This is particularly true when an individual is trying to juggle multiple responsibilities or faces situations that are challenging or unfamiliar. For example, researchers have looked at the effect of coloring on anxiety reduction after participants engaged in a feared situation. Results suggest that engaging in coloring helps to reduce anxiety and increase mindfulness, or being aware of one’s present surroundings in a healthy way. Another study found that participants who colored a mandala reported 20% less anxiety than those who colored other geometric shapes, and 72% less anxiety than those who engaged in unstructured coloring.

One of our goals for this study is to provide you with a tool to help you when you are in challenging situations. As mentioned, you will be given the opportunity to color a mandala so you can familiarize yourself with them and experience the benefits of coloring one, including reduced anxiety and increased focus. Later, when you find you are juggling multiple responsibilities or feel an increase in your anxiety, you may want to use coloring as a simple tool to self-soothe and alter your behaviors. If you have any questions about coloring, the benefits that are associated with it—including how to do it—please ask the researcher now.
APPENDIX O

MANDALA FOR THE CONTROL CONDITION
Appendix O: Mandala
Appendix P: Informed Consent

INFORMED CONSENT FORM
Beliefs, Behaviors, and the Self

I agree to participate in the research project titled “Beliefs, Behaviors, and the Self” being conducted by Sara Conley, a graduate student at Northern Illinois University (NIU). I have been informed that the purpose of this study is to examine various relationships between beliefs people hold, behaviors they engage in, and what they tell themselves in different situations.

I understand that if I agree to participate in this study, I will be asked to complete questionnaires, read documents, and participate in a behavioral task. In total, this study will require approximately 90 minutes of my time.

I have been informed that potential risks and/or discomforts I could experience during this study include finding some of the questionnaire items to ask about sensitive information. Additionally, I may experience momentary discomfort during the behavioral task. As such, although I am encouraged to answer all questions and participate to the best of my ability in each part of the study, I may omit any questions that I do not wish to answer, decline to complete any task, and/or discontinue participation at any time without penalty.

I understand that all information gathered during this study will be kept confidential and that my name or personal identifier will not appear on any of the data forms. After PSYC 102 credit has been assigned, all information that could identify me will be removed from the data. I have been informed that any subsequent presentations or publications that include these data will report only group-level data.

I understand that there may be no direct benefit to me for participating in this study. Its main purpose is research. I am aware that my participation in this study is voluntary and may be withdrawn at any time without penalty, and that if I have additional questions concerning this study, I may contact Sara Conley (sconley1@niu.edu) or her research advisor, Dr. Kevin Wu (kevinwu@niu.edu). I also understand that if I wish to learn about one’s rights as a research participant, I may contact the NIU Office of Research Compliance at 815-753-8588.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I will receive a copy of this consent form should I request one.

__________________________________________
Signature                      Date

__________________________________________
Printed Name
APPENDIX Q

DEBRIEFING FORMS
Appendix Q: Debriefing Forms

DEBRIEFUNG – Form A

Beliefs, Behaviors, and the Self

Thank you for participating in our study entitled “Beliefs, Behaviors, and the Self”, the study is now complete. The purpose of the study was to examine various relationships between beliefs people hold, behaviors they engage in, and what they tell themselves in different situations. Specifically, we wondered whether students who utilized positive self-talk would be more willing to engage in certain behaviors and experience less anxiety while doing so compared to students who participated in the control condition. A model of obsessive-compulsive disorder (OCD) suggests control-related beliefs may contribute to avoidance behaviors, and that positive self-talk may increase feelings of control, thereby decreasing avoidance. The main goal of the current study is to better understand mechanisms for treating contamination-related anxiety. You indicated on one of our questionnaires that you have a current diagnosis of OCD. To ensure your safety and prevent you from experiencing distress, the study was discontinued upon completion of the questionnaires. We understand that the content that was covered in the questionnaires may be highly relevant to your diagnosis, so should you have any concerns related to increased symptoms you are encouraged to contact the professionals listed on the Counseling Resources form made available to you. Further, if you have questions regarding the study, you may contact Sara Conley (sconley1@niu.edu), or Dr. Kevin Wu at kevinwu@niu.edu. If you are interested in reading further about this type of research, the following two journal articles are available either through the NIU Library or from Sara Conley (the study PI).


Finally, please do not discuss your experiences in this study since we are planning to continue data collection during the remainder of the academic year. Too much knowledge about the study or its details could interfere will with the experience for subsequent students in your class and also render their data invalid.
Thank you for participating in our study entitled “Beliefs, Behaviors, and the Self”, the study is now complete. The purpose of the study was to examine various relationships between beliefs people hold, behaviors they engage in, and what they tell themselves in different situations. Specifically, we wondered whether students who utilized positive self-talk would be more willing to engage in certain behaviors and experience less anxiety while doing so compared to students who participated in the control condition. A model of obsessive-compulsive disorder (OCD) suggests control-related beliefs may contribute to individuals being extremely uncomfortable with aversive situations (e.g. touching contaminated objects), and that positive self-talk may increase feelings of control, thereby decreasing avoidance. This study used a brief self-talk intervention to determine whether use of positive self-talk would lead to an efficient reduction in anxiety. We also collected information from you about your personal characteristics, such as your level of OC-symptoms and control beliefs, in case those variables explain any differences that this study may find.

We did not reveal our specific study goals before you completed the experiment because we did not want your knowledge of our goals to influence the way that you responded to survey questions or the behavioral tasks. We did not inform you of details of the behavioral task prior to the study, including the fact that a majority of the stimuli were fabricated in lab to reduce contamination and ensure your safety; because we did not want to cause anxiety or influence your decision regarding whether to touch an item during the task. Our main goal is to better understand mechanisms for treating contamination-related anxiety. Additionally, please understand that nearly everyone endorses feelings of anxiety but very few people go on to have problems consistent with OCD. For example, many people endorse the questions we asked about washing their hands, but it is only when those preferences are (1) very strong and (2) distressing in daily life that they are a clinical problem. None of the feedback you were given during this study should be considered clinically relevant to you or to the information you provided.

However, should you have any concerns about whether you exhibit such problems, you are encouraged to contact the professionals listed on the Counseling Resources form made available to you, they will be able to perform a formal clinical assessment of the issues raised in this study. Further, if you have questions regarding the study, you may contact Sara Conley (sconley1@niu.edu) or Dr. Kevin Wu (kevinwu@niu.edu).

If you are interested in reading further about this type of research, the following two journal articles are available either through the NIU Library or from Sara Conley (the study PI).


*Please* do not discuss your experiences in this study since we are planning to continue data collection during the remainder of the academic year. Too much knowledge about the study or its details could interfere with the experience for subsequent students in your class and also render their data invalid.
APPENDIX R

COUNSELING RESOURCE LIST FOR PARTICIPANTS
Appendix R: Counseling Resource List

COUNSELING RESOURCES IN DEKALB
DeKalb and Northern Illinois University are fortunate in having several free or low-cost counseling services available to the community. This list is intended to help you find timely and appropriate assistance. Sometimes one agency will have a high demand for services that necessitates a waiting period for new clients, or you may have personal reasons for choosing one agency over another. Counselors at any of these agencies will gladly assist you in making a final decision about where to seek help.

CAMPUS SERVICES
COUNSELING AND STUDENT DEVELOPMENT CENTER, NIU (STUDENTS ONLY)
Phone: 815-753-1206
Address: Campus Life Building – 200
Fees: None for counseling, modest testing fees.
Hours: 8:00am – 4:30pm Monday-Friday. Open whenever NIU is open, including breaks
After Hours: Assistance after hours available by calling – 815-753-1212

Description of Services: This service provides students with short-term, individual and group counseling for a broad range of personal concerns. Career counseling services include interest assessment, workshops, and use of computerized career counseling programs. Educational counseling services include assistance with test anxiety and study skills. Assessments of drug and alcohol abuse are also provided. First appointment scheduled within 3-7 days. (Handicapped Accessible)

COUNSELING LABORATORY, NIU
Phone: 815-753-9312
Address: 416 Graham Hall
Fees: None for students, faculty, or staff.
Hours: Call for available counseling hours.

Description of Services: A wide range of services are offered by the counselors including both personal and vocational counseling. In general, the approach used is one that promotes growth and focuses on increasing emotional well-being and self-awareness. All counselors are either doctoral or masters level students who are being supervised by members of the counseling faculty. First appointments scheduled within 3-5 days.

FAMILY CENTER, NIU
Phone: 815-753-1684
Address: 429 Garden Road
Fees: $5.00 per session fee for students. Faculty, staff, and community members charged on a sliding scale. No one will be denied services due to inability to pay.
Hours: Wednesday – 2:00 pm – 10:00pm; Thursday – 10:00 am – 10:00 pm
By appointment Monday through Friday.
Open whenever NIU is open, including breaks.
Description of Services: Individual, couple, and family counseling. Services provided by graduate students under the supervision of Marriage and Family Therapy faculty. First appointment scheduled within 4 days.

PSYCHOLOGICAL SERVICES CENTER, NIU
Phone: 815-753-0591
Address: Normal Road and Lincoln Hwy.
Fees: No fee for students. Sliding fee scale for Faculty, staff, & community members.
Hours: Monday – 12:00 noon – 8:00 p.m.; Tuesday – 11:00 a.m. – 7:00 p.m.
       Wednesday–Friday 9:00 a.m. to 5:00 p.m.;
       Open whenever NIU is open, including breaks

Description of Services: Individual, couple, family, and group psychotherapy, Intellectual, personality, and academic assessments. Clients are generally seen by advanced level graduate student staff under faculty supervision. Services tailored to meet a client’s specific needs. (Handicapped accessible.)

UNIVERSITY RESOURCES FOR WOMEN
Phone: 815-753-0320   Address: 105 Normal Road
Fee: No fee for students, faculty or staff
Hours: Monday – Friday 8:00am – 4:30pm; Evening hours by appointment.
       Open whenever NIU is open, including breaks.

Description of Services: Short-term counseling to individuals about their academic progress, careers, personal development, and other special concerns. Offered also are support groups, information and referral, issues regarding workplace disputes, and issues involving sexual harassment. (This facility is handicapped accessible.)

COMMUNITY RESOURCES

Private counselors, clinical social workers, doctors and therapists are available in the yellow pages of the phone book under “Mental health professional” or “Mental Health Services” or “Social Services”.

BEN GORDON COMMUNITY MENTAL HEALTH CENTER
Phone: 815-756-4875
Address: 12 Health Services Drive – DeKalb
Fees: Sliding fee scale based on income. Insurance accepted.
Hours: Monday-Thursday: 8:00am – 8:30pm; Friday: 8:00am–5:00pm
After Hours: 1-866-242-0111 Crisis Line

Description of Services: Comprehensive counseling services to all residents of DeKalb County. Services to all persons affected by mental health problems, substance abuse, family/child welfare concerns. 24-hour sexual assault/abuse services can be accessed through the Crisis Line. First appointment scheduled within 30 days. (Handicapped accessible and on Campus Bus Route).
FAMILY SERVICE AGENCY, CENTER FOR COUNSELING

Phone: 815-758-8636
Address: 14 Health Services Drive – DeKalb
Fees: $75.00 per visit. Insurance accepted, including NIU Student Insurance. Payment plans and scholarship funds available.
Hours: Monday–Wednesday: 9:00am–8:00 pm; Thursday–Friday: 8:00am–4:00pm
Additional hours available by appointment.

Description of Services: Individual, couple, group counseling for children, adults, senior citizens, and families. First appointment scheduled within 1-7 days. (Handicapped accessible and on Campus Bus Route).