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A Brief Rational Disputation Exercise Enhances Cardiovascular, Anxiety, and Affective Recovery Following Worry-Recall

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A BRIEF RATIONAL DISPUTATION EXERCISE ENHANCES CARDIOVASCULAR, ANXIETY, AND AFFECTIVE RECOVERY FOLLOWING WORRY-RECALL

by

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ABSTRACT

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Rational Emotive Behavior Therapy (REBT) (Ellis, 1958), educates a client on the relationship between one's irrational beliefs (IBs) and the dysfunctional emotional/behavioral consequences of maintaining those beliefs such as symptoms of anxiety, depression, and sleep dysfunction (Ellis, Gordan, Neenan, & Palmer, 1997), symptoms also commonly correlated with high trait perseverative cognition (PC; Verkuil, Brosschot, de Beurs, & Thayer, 2009). In addition to symptoms of anxiety and depression, high levels of PC, a construct comprised of measures of trait worry and rumination, have been linked to acute cardiovascular (CV) health concerns that overtime when left unmitigated may lead to chronic conditions like hypertension (Ottaviani et al., 2016). Therefore, this study aimed to determine if a brief REBT-based rational disputation exercise was beneficial for those with high PC as evidenced by acute CV, anxiety, and affective recovery to an in-lab worry-recall task. 28 undergraduate students from a midsized urban university were recruited for an in-lab study and randomly assigned to one of two groups; the experimental group utilized a brief rational disputation exercise following worry-recall and the control group sat quietly. Blood pressure (BP), heart rate (HR), affect, and state anxiety were measured throughout the length of the visit. Those in the experimental group experienced significant decreases in SBP, DBP, and HR when asked to think about their new, rational belief and the potential emotional/behavioral benefits of that new belief compared to their SBP, DBP,

and HR following the rational disputation exercise. The experimental group had significantly more positive affect, less negative affect compared to the control group at the end of the study. Both groups recovered in levels of state anxiety at the end of the study compared to baseline/pre-study measures. Implications for these findings may include helping those with risky PC profiles more effectively cope with high worry and rumination via brief rational disputation training.

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1. Perseverative Cognition – PC
2. Rational Emotive Behavior Therapy – REBT
3. Irrational Belief(s) – IB/IBs
4. Cardiovascular – CV
5. Systolic Blood Pressure – SBP
6. Diastolic Blood pressure – DBP
7. Heart Rate – HR
8. Blood pressure – BP

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I dedicate this project to my mom, Debbie and my dad, Gino. Each of your unique brands of support and wisdom in combination brought me to this place in time. I am eternally grateful to have been raised in an environment where education was fun and rewarding, having a curious intellect was encouraged, and discipline was ingrained as an essential feature of academic success.

Albert Ellis developed a form of cognitive therapy, Rational Emotive Therapy (RET) in the late 1950s and today, this therapy is known as Rational Emotive Behavior Therapy (REBT; Tiba, 2010). Ellis recognized the importance of the significant beliefs one holds about oneself, others, and the world, and how those beliefs affect one's emotional and behavioral responding to events in one's life Ellis noted that when these beliefs were irrational, dysfunctional emotional/behavioral responses, including but not limited to anxiety, depression, and poor sleep, would soon follow (DiGiuseppe, Doyle, Dryden, & Backx, 2014; David, Freeman, & DiGiuseppe, 2010; Ellis, 2006; Ellis, Gordon, Neenan, & Palmer, 1997). He also did not like the often cumbersome, time-consuming, and interpretational nature of psychoanalysis, the arguably most popular psychotherapy of the era (Ellis & Ellis, 2014). Thus he developed REBT, a theoretically quicker, action-oriented therapy; a therapy aimed at exposing the client's irrational beliefs (IBs), educating the client about how one's dysfunctional emotions/behaviors are related to their IBs and not the event or situation itself, and cognitively restructuring IBs into rational beliefs (RBs).

Though REBT has existed for over half a century, there remains a great deal still unknown about the physiological effects of REBT or components of REBT. Therefore, little is known regarding this technique's potential to benefit CV responding, especially for those who have a high propensity for worry and/or rumination, traits that also happens to be some of the most common dysfunctional emotional/behavioral consequences of IBs (Chang & D'Zurilla, 1996). The combination of worry and rumination are used to form the psychological construct known as perseverative cognition or PC (Brosschot, Gerin, & Thayer, 2006; Brosschot, Verkuil, & Thayer, 2010). Importantly, high levels of state and/or trait PC have been causally linked to poor CV recovery, or in other words the failure of measures of CV responding, like blood

pressure (BP) and heart rate (HR), to successfully return back to resting levels following stressful experiences (Verkuil et al., 2009, Ottaviani et al., 2016; Pieper, Brosschot, van der Leeden, & Thayer, 2010). Thus, due to a lack of effective coping skills and poor CV recovery over time, those with high PC (vs. low) are at more risk for negative chronic health outcomes (Brosschot et al., 2006; Weise et al., 2013, Knepp, & Friedman, 2008).

Due to the theoretical purpose of REBT, (i.e., cognitive restructuring IBs in order to promote positive emotional and behavioral consequences) a brief REBT-based exercise may be beneficial for psychopathologically sub-clinical, though at-risk populations (Vernon, 2011; Ellis & Bernard, 2006; Sapp, 1996). In particular, an REBT-based exercise may help those with high PC cope more effectively with worry/rumination before these behaviors become psychologically and physiologically debilitating. With that, however, more research is needed to find support for such a hypothesis. Thus the purpose of the current study was to investigate the effects of a brief REBT-based rational disputation exercise on CV, affect, and state anxiety following a worry-recall task in those suffering with high levels of PC in order to elucidate the potential health benefits of such an exercise and at the same time, increase the greatly needed breadth of research related the use of REBT in practice.

REBT and Characteristics of an Irrational Belief

REBT is currently utilized in a multitude of settings with both clinical and non-clinical samples, including individual therapy (Ellis et al., 1997), group therapy (Dryden, 2013), and also educational settings with children and adolescents with the goal of increasing frustration tolerance (Banks, 2011), self-esteem (Sapp, 1996), and reducing symptoms of anxiety and depression (David, Freeman, & DiGiuseppe, 2010; Alden & Safran, 1978; Ellis, 1962). The goal of REBT is straight forward: identify IBs, educate client on the connection between IBs and

emotional/behavioral outcomes, restructure IBs to RBs, and after diligent practice and use of new RBs, enjoy positive emotional/behavioral outcomes. REBT attempts to restructure IBs which is a proactive strategy for coping with stressful events. In essence, by challenging and restructuring one's IBs, the overall number of events or situations one worries about is reduced. Thus, if there are fewer situations to worry about in the first place, naturally, a person is likely to suffer less emotional and behavioral consequences. This study was aimed at determining if in addition to positive emotional/behavioral outcomes, rational disputation can reduce CV risk as well.

Ellis believed that it was psychologically normal to experience emotions that are congruent to one's troubling or stressful life experiences, whether it be anger or sadness for example, as these emotions are adaptive to effective problem solving (Ellis et al., 1997). However, he noted that if one's belief structure is inflexible, one cannot effectively cope with the often large number of various stressors in life and thus in turn, one may suffer difficult emotional/behavioral consequences as a result of one's inability to adjust one's beliefs system per the unpredictable nature of stressors. The solution therefore, according to Ellis, was that one must temper their beliefs to avoid psychological disturbances stemming from a rigid and irrational belief structure (Ellis et al., 1997; DiGiuseppe et al., 2014). As is true with cognitive therapy in general, the focus of REBT is to address psychological disturbances (e.g., anxiety and depression) by means of examining, challenging, and adjusting one's faulty belief structure (DiGiuseppe et al., 2014; Beck, Rush, Shaw, & Emery, 1979; Beal, Kopec, & DiGiuseppe, 1996).

The hallmarks of an IB are that they are inconsistent with reality, rigid in nature, and thus ultimately self-defeating emotionally, behaviorally, functionally, etc. With REBT, a client and

their therapist can evaluate and revise that IB through utilization of a number of disputation techniques and form a new RB in its place (Ellis et al., 1997; DiGiuseppe et al., 2014; Harris, Davies, & Dryden, 2006). It is critical to note that in later writings, Ellis stated that his choice of words, i.e., "Irrational Beliefs" were poor, in that the connotation of 'irrational' was too narrow. Ellis expressed his wish for the term "Irrational Beliefs" to be changed to "Dysfunctional Beliefs (DB)" or "Self-Defeating Beliefs (SDB)" (Ellis, 1996). It is important to note this adaptation because conceptually Ellis writes that "irrationality" can be "…defined as, (a) that which prevents people from achieving their basic goals and purposes, (b) is illogical, and (c) is empirically inconsistent with reality" (Ellis et al., 1997, p. 5). For the sake of this study, IB, DB, and SDB are used interchangeably.

Ellis noted that IBs were generally categorized by four types, namely: demandingness, awfulizing/catastrophizing, low frustration tolerance, and self-downing (Tiba, 2010; DiGiuseppe et al., 2014) and that the cornerstone of the perpetuation of IBs is the repeated utilization of exaggerated language (Tiba, 2010). For example, a person who has IBs of the self-downing form may call his or herself "worthless" or "no good." Those with low frustration tolerance may use language like "I can't stand it" and those with catastrophizing IBs may use phrases like "my life is over" when describing a poor grade on an exam or a break-up with a significant other. According to Tiba (2010) these IBs, or put in a different way, cognitive distortions, lead to emotional disturbances as a result of the schematic representation of such language when applied to the individual on a personal level. Such negative schemas of a "worthless" person then activate cognitive visual representations of worthlessness which are thought to then trigger emotional reactions congruent to the schema of worthlessness (Tiba, 2010). For example, when a person sees a piece of crinkled up, dirty, torn, wet cardboard box lying in an alley they are

walking through, they may assert that it is a worthless piece of garbage. They may describe it as dirty, gross, germy; they may think about the times where they saw a homeless person sleeping on a cardboard box and perhaps the smell that emanated from the garbage dumpster nearby. The person may feel sadness for the homeless person or guilt for not giving the person money. Therefore, according to Tiba (2010) when a person utilizes the word "worthless" in describing oneself, they attribute the schematic characteristics of worthlessness onto his or herself. Ellis and other REBT researchers (Sapp, 1996) stated that overtime, the use of these bits of exaggerated language activate said schemata and thus become personal philosophies which when triggered repeatedly overtime are the fundamental bases of rigid IBs and eventual psychological disturbance (Ellis, 1962).

However, Ellis also noted that it is within the individual's control to change these IBs via cognitive restructuring, via disputational techniques (Ellis et al., 1997). It is for this reason that the therapist examines closely the client's verbal expressions of faulty cognitive interpretations (IBs) and why Ellis and colleagues focused on helping the client recognize the relationship between the language they use in describing their beliefs, (i.e., demanding, awfulizing/catastrophic, frustration, self-downing) and then dispute the validity of this language (and in turn schema about oneself, others, and the world) via the techniques discussed below.

Irrational Beliefs Affect Psychological and Physical Health

The relationship between IBs and dysfunctional emotional, behavioral, and cognitive health are measureable. One study found that when experimentally manipulated, participants asked to verbalize self-downing IBs related to task performance (e.g., "If I do not do this perfectly well next time it will prove I am stupid" (Schill, Monroe, Evans, & Ramanaiah, 1978,

p. 4) showed greater emotional distress and poorer task performance compared with those asked to verbalize a rational statement (Schill et al., 1978).

According to David, Freeman, and DiGiuseppe (2010), assessments of IBs are associated with emotional symptoms in both clinical, non-clinical, and college student populations. High amounts of IBs have been associated with anxiety (Ellis et al., 1997; Chang & D'Zurilla, 1996), fear of negative judgment by others (Alden & Safran, 1978), depression (Dryden, 2013; Rohsenow, & Smith, 1982), and Type-A behavior (Smith & Brehm, 1981). Further research is warranted, however, as the assessments thus far do not do an adequate job teasing apart emotions from beliefs, nor do these correlational studies have the ability to explain a cause-effect relationship (Dryden, 2013).

According to Alden and Safran (1978) individuals that ascribe to a greater amount of IBs are more self-critical and concerned with the evaluation of others, characteristics that perpetuate difficulties in social situations, including non-assertiveness. Furthermore, these individuals tend to be perfectionistic, setting unrealistically high standards and goals for themselves which in turn inevitably results in failure to attain said goal. These series of events tend to correlate with emotional/behavioral consequences like anxiety, guilt, self-blame, and remorse (Alden & Safran, 1978).

Another characteristic related to IBs, though also positively enhanced by REBT is self-esteem. A series of studies analyzed by Sapp (1996) show evidence that self-esteem and self-concept are significantly correlated with REBT therapy in that REBT-based psychoeducation and training for at-risk African-American middle-schoolers increased their pre versus post-test levels of self-esteem especially when referring to academic success. Furthermore, another meta-analysis conducted by Hajzler and Bernard (1991) of 46 studies found that after REE (rational

emotive education) for adolescents and found that in addition to an increase in self-esteem, the participants also showed a greater internal locus of control post treatment than prior to treatment.

Another consequence related to high levels of maintaining IBs as discussed above, is worry and rumination. By proxy, those with IBs tend to suffer sleep difficulties as a function of worry and rumination (Calmes, & Roberts, 2007; Chang, & D'Zurilla, 1996; Ellis, 2006; Ellis et al., 1997). Sleep difficulties are also found as symptoms of clinical anxiety and depressive disorders (APA, 2013) and thus whether an individual has a psychiatric diagnosis or not, the relationship between traits of worry and rumination and sleep difficulties is strong.

ABC(DE) Model of REBT

The modern form of REBT is broken down into a five-step sequence that forms the acronym, "ABCDE" (Ellis et al., 1997) which stands for, respectively, activating event, beliefs, emotional consequence, disputation, and new effective (or new emotional/behavioral consequences). David et al. (2010) note that the ABC(DE) model can be used not just in understanding psychopathology but more broadly in educational, industrial, and health care settings to predict, describe, and understand human behavior. Generally speaking, each component of the ABC(DE) model serves a theoretical purpose and when the connection between each component is understood by the client, should over time and practice lead to a philosophical paradigm shift which ultimately leads to more rational processing of troubling events in the future (David et al., 2010) and thus fewer negative emotional/behavioral consequences. According to the theory, A and C are mediated by B, or in other words, one's beliefs, be they rational or irrational, mediate the appraisal of life events and one's emotional distress (David et al., 2010). The ABC(DE) model is described here in greater detail:

Activating event. This is any event, or series of events that has/have occurred in the past, is occurring in the present, or will occur in the future, real or imagined, that is distressful or disturbing to the client (Ellis et al., 1997; Dryden, 2013). An example of an activating event may be conversations with one's mother regarding marriage, or for college students, examinations or having to give an important speech.

Beliefs. The IB is an inflexible, dominating belief or series of beliefs that are rigid in nature about a) the way one ought to be, b) others ought to be, or c) the world ought to be (Ellis et al., 1997). These beliefs are theoretically believed to be part of a larger personal dogma or philosophy developed socially by the teachings of one's parents, culture norms, expectations of one's religion, or experiences with the world otherwise (Ellis et al., 1997; Sapp, 1996). For example, utilizing the scenario above of the conversations with one's mother about marriage; if for instance the mother feels that a woman must find a good husband, get married, and have children, she may impress this belief upon her daughter who may adopt it as her own. Ellis would argue that this belief is irrational due to fact that a) it is rigid and inflexible b) it is about how one "ought" to be and c) there is evidence to the contrary (about what women do) that disputes this claim. An RB, therefore, is flexible (or non-dogmatic in nature), tolerant of uncomfortable situations/events in life, non-awfulizing, and accepting of life (Dryden, 2013). Therefore, an RB related to the above example would be something like, "I would like to be married and have children, and it would be unfortunate if I didn't, but it does not make me any less of a woman if I don't."

Emotional/behavioral consequences. These are the consequences one experiences as a function of their IBs in the presence of an activating event. Dryden (2013) adds "cognitive" consequences as well, adding that IBs are at the core of distortions in thinking about the

activating event which may entail extreme thinking or catastrophizing related to potential outcomes of said event. Ellis found that when one interprets an activating event with a rigid and irrational belief system they are more likely to experience psychological disturbances like symptoms anxiety and depression (Ellis et al., 1997), for example, excessive worry, irritability, difficulty concentrating, changes in sleep habits, feeling down/sad, and loss of interest in previously enjoyed activities (APA, 2013). Dryden (2013) notes a pattern between the dysfunctional emotion and the dysfunctional behavior, for example, anxiety often is related to withdrawing or avoiding perceived threats whereas depression is related to withdrawal from enjoyable activities. On the cognitive spectrum of negative consequences, Dryden (2013) notes that anxiety is related to the cognitive distortion of an overestimation of negative consequences if a threat actually takes place and depression is related to the cognitive distortion of hopelessness and helplessness.

Disputation. Disputation is the method utilized by therapists during REBT (and CBT in general) as a means of provoking cognitive reframing of an IB (Ellis et al., 1997). This is one of the main features of the ABC(DE) theory (and REBT in general), as this is the point at which a person's IB is challenged. In support of this technique, a study investigating stress-related growth (i.e., positive cognitive and behavior change after a traumatic event) conducted by Moore, Varra, Michael, and Simpson (2010) investigated the effects of positive cognitive reframing on a sample of veterans receiving care at a VA hospital. Moore et al. (2010) found that stress-related growth was associated with greater use of positive reframing by participants. As Lambert et al. (2009) states, "…positive reframing in intervention or therapy should be a priority (p., 629)."

Ellis and his scholars have developed four types of disputation strategies, namely: logical, empirical, functional, and rational alternative and these four strategies are articulated via four styles, namely: Socratic, didactic, metaphor, and humor. Theoretically, the therapist should utilize whichever technique is a best fit for the particular client and situation and may vacillate between techniques with the same client. A highly skilled REBT therapist may choose to interconnect various strategies and styles (Beal, Kopec, & DiGuiseppe, 1996). Beal et al. (1996) designed a "Disputation Matrix" which organizes all 16 combinations of the strategies and styles (see Figure 1) discussed here.

Four types of rational disputation arguments. *Logic.* This argument is meant to appeal to reality and logical patterns. It is philosophical in nature and addresses one's IBs by pointing out that in many cases, the belief is illogical. For example, a person may believe that if she fails out of college she is a failure in life. . It is not a logical argument that failure in college equates to or results in failure in life since life does not equal college; they are different circumstances.

Empirical. The empirical argument asks for the client to observe what the evidence is for their belief. Utilizing the college example above, the therapist may ask the client to identify a person they know (or the therapist may offer up an example if the client cannot think of one) of a person who failed in a class, but indeed graduated from college. Some exemplars of successful people who did not graduate from college are Oprah Winfrey, Steve Jobs, and Abraham Lincoln (Perez, A., 2013). This type of argument is thought to enhance the salience of the tangible evidence against one's IB (Ellis et al., 1997).

Functional. This method of argument focuses on the consequence, be it emotional or otherwise, of the IB on the client. The therapist will often ask or point out how the IB negatively affects the client's day-to-day functioning or future life goals. For example, a therapist may ask

the client how the belief that "I must be respected by my coworkers" has benefited or hurt them emotionally/behaviorally. The client may respond by saying that it makes her feel frustrated and angry a lot, which in turn seems to affect her productivity at work. Therefore, functionally, this IB is not helpful to the client if it produces serious and disturbing negative emotional/behavioral consequences (DiGuiseppe et al., 2014).

Rational alternative. This is a method of argument that asks the client to think of a rational alternative to their current IB. A rational alternative should be a belief about the event that has real potential of occurring. This approach is of particular importance to the current study proposal as it is the specific tactic that will be used in experimentation. The reason for the use of this type of argument is that it is the only one that will allow the participant to leave the experiment with an actual alternative belief to engage with and practice. . Furthermore, one's ability to self-select the rational alternative his/herself (in comparison to ascribing one for them or utilizing one of the other three strategies that do not directly result in a new RB option) may reduce negative cognitions and enhance one's long term continued use of said RB (Merritt et al., N.d.)Beal et al. (1996) note that it is critical in the effectiveness in cognitive restructuring that a belief not only be disputed, but an equal if not better alternative be elucidated. Furthermore an effective rational alternative should be logically and empirically sound and also provide the client with a more positive emotional and behavioral outcome than their currently held IB (Beal et al., 1996).

Finally, Beal et al. (1996) note that the "prototypical model" of a rational belief statement would be, something similar to "I would like very much to have [x] and I will work very hard to get [x] but even if I don't get [x] it doesn't mean that I'm no good" (p. 220). Depending on the style of delivery, however, the rational alternative strategy may be formed into a question as well

(Beal et al., 1996), for example, "What do you think would be a more helpful and adaptive belief that you can create right now about yourself in the situation [x]" (p. 227).

Four types of styles to be used with disputational strategies. *Socratic.* This disputation style is the most philosophically existential in nature and is aimed at challenging one's personal paradigm regarding their belief system. It is seen as being the mainstay of the REBT therapist and encourages the client to reason with his/herself (Beal et al., 1996). This style is of particular importance to the current study proposal as it will be the style of choice used with the rational alternative strategy discussed above. This style was chosen specifically because it is more succinct in nature than using metaphors, but more thought-provoking than a didactic strategy and can be engaged when one only has only a brief period with a client or participant. According to Beck (1979) it is important to encourage the client to articulate what he/she is thinking, rather than the therapist telling the client what is important. The core of the Socratic method is to allow the client to reach their own conclusions (Clark & Egan, 2015) as opposed to other styles (discussed below) that do not elicit the same client response.

Metaphor. The metaphor style utilizes examples as a means of describing the client's situation but while using a creative way to dispute or challenge the client's IB (Beal et al., 1996).

Humor. With humor, Ellis and colleagues felt that the therapist can dispute a client's IB by simply poking fun at it and also using other similar yet humorous examples of what their IB may lead to (Beal et al., 1996).

Didactic. This is considered the "teaching" style of disputation. It can be interpreted as being the most straight-forward and direct method of disputation where there is a lack of metaphorical or interpretational disputation (Ellis et al., 1997).

New emotional/behaviorally efficient approach. Once cognitive restructuring, or in other words, shifting to a rational belief system occurs, one may avoid or reduce feelings of anxiety and depression (Ellis et al., 1997). Therefore, when one utilizes a flexible, more rational belief system, the emotional consequences should be that of an effective nature, sparking healthy problem solving, and healthy emotional/behavioral consequences (Ellis, 2006).

Perseverative Cognition and its Effects on the Mind and Body

Borkovec et al. (1998) theorize that worry is primarily negative self-talk thoughts, or in other words, the experience of talking to oneself about mostly negative events that one fears may happen in the future. Nolen-Hoeksema, Parker, and Larson (1994) define rumination as excessive, passive worry about depressive symptoms. Nolen-Hoeksema also notes that those who ruminate frequently are much more vulnerable to depression (Nolen-Hoeksema, 1987). PC is a construct formed to measure the combination of these two features of cognition and often used for research purposes to qualify an individual as high or low PC (Brosschot et al., 2006).

PC and IBs are theoretically similar in nature as they both are conceptualized as negative and maladaptive cognitive patterns of thoughts, self-talk, and even negative visual imagery (Borkovec et al., 1998) that are correlated or causally linked with emotionally, behaviorally, and physically disturbing consequences (Franzen et al., 2011, Ellis et al., 1997, DiGiuseppe et al., 2014; Brosschot et al., 2006). There is support for this claim as well, in that worry and IBs are positively correlated (Lorcher, 2003). It is for this reason that a brief REBT-based rational disputation exercise may be enhance emotional states, and CV recovery for those suffering with high levels of PC. A brief rational disputation exercise may also be a useful tool to help instigate change in one's IBs into more effective and helpful RBs.

PC and correlated psychosocial traits. Psychologically speaking, high PC individuals report more negative affect and greater frustration than their low PC counterparts during experimentally induced periods of acute stress (Di Paolo, 2013; Brosschot et al., 2006; Calmes et al., 2007). This is an interesting parallel to frustration-intolerance which one of the four major types of IBs. A study by Di Paolo (2013) found that adding to the profile of those with high levels of PC are also significantly higher levels of desire for control, high striving behavior for goals, self-efficacy, and levels of perceived stress than those with low PC. A higher desire for control and striving towards goals in those with high PC may be indicative of a theme mentioned previously; that those who endorse IBs tend to have perfectionistic and irrationally high standards for themselves. It is also logical that those who worry and ruminate frequently appraise or perceive their lives as most stressful, as indicated by higher scores on the perceived stress scale (Di Paolo, 2013; Key et al., 2008; Ruscio & Borkovec, 2004) though the direction of this relationship, i.e., does perceived stress instigate higher worry/rumination, or the other way around, is still debatable.

In addition, a pilot study conducted by Merritt, Di Paolo, and Zawadzki (N.d.) found further evidence of how PC is related to both psychological and behavioral health. This study found a link between coping with stress and utilizing a self-selected leisure activity (SSLA). A SSLA is defined as an activity one uses to cope with stress that is already familiar and enjoyable to them (Merritt et al., N.d.). This study found that the use of SSLAs was related to a self-reported decrease in negative thoughts (rumination) as well as an increase in levels of cognitive distraction when participants were highly engaged or absorbed into their SSLA (Merritt et al., N.d.). Also, high levels of PC moderated the relationship between depression and thinking negative thoughts in that as the level of negative thoughts increased, so too did level of

depression. Again, here in lies a parallel to the emotional dysfunction that occurs between those with high PC and those who endorse IBs, i.e., negative thoughts affecting level of depression.

PC and sleep. Poor sleep quality is a behavior repeatedly shown to be intimately related to PC (Merritt et al., N.d.; Chen, Gelaye, & Williams, 2014; Digdon & Koble, 2011; Edinger, Wohlgemuth, Radtke, Coffman, & Carney, 2007; Nicassio, Mendlowitz, Fussell, & Petras, 1985), a point echoed by Borkovec (1982) who noted that worrying before bed (and interestingly worrying about sleep quality or falling asleep) was a primary cause of insomnia. In further support of the relationship between PC and sleep, a study conducted by Franzen et al. (2011) found that when sleep deprived, young, healthy participants showed significantly higher elevated systolic BP immediately prior to a social stressor speech task than those participants who got a restful night's sleep. Furthermore, subjective ratings of stress were higher for those sleep deprived immediately prior to their stressor task, showing the correlation between fatigue and one's cognitive interpretation of stress. The authors speculate that both the objective and subjective indicators of increased stress could be due to anticipatory thought processes that occurred for those who were sleep deprived. Therefore, those who worry and ruminate heavily (i.e., high PC) experience sleep dysfunction related to their intrusive thoughts, and then subsequently experience increased perceived stress the following day during stressful events related to their lack of sleep. Taken together, poor sleep quality is a behavioral consequence for both those with high PC and those who endorse IBs.

Finally, there is another comparison here between high PC individuals and a comment made by Ellis (2006) in regards to some of the behavioral consequences experienced by those with IBs. Ellis (2006) notes that those who excessively ruminate never relax and even while they sleep are anxious. Though a statement about anxiety *during* sleep is speculative, Kelly (2002)

stated that those who are short sleepers (< 6 hours of sleep a night) report significantly more symptoms of anxiety than long sleepers (> 8 hours a night) in general. In addition to symptoms of anxiety, Kelly (2002) noted that short sleepers also are more likely to be neurotic, worry more, be less creative, experience hallucinations, and perform more poorly on perceptual-motor tasks Kelly (2002) surmises that the brain may attempt to compensate for a lack of sleep and as a result, those who do not sleep enough suffer a number of the aforementioned side effects. This reveals the cyclical nature of the effects of negative, intrusive thoughts on health and specifically how a lack of sleep affects cognition and vice versa (Ellis, 2006). It is for this reason that behavioral measures of sleep quality were assessed in this study.

PC versus anxiety and depression. It should be noted for clarification sake that worry and the symptoms of anxiety, though sharing some overlap, are not mutually exclusive. The same is true for rumination and depression. In other words, one may experience worry and rumination and even very high levels of it, though still not meet the criteria for a clinical diagnosis of anxiety disorder, for example generalized anxiety disorder (GAD) or a depressive disorder like Major Depressive Disorder (APA, 2013). Ruscio notes that *most* individuals who are high worriers will not meet the criteria for a GAD diagnosis (Ruscio, 2002). Ruscio and Borkovec (2004) note that one of the biggest differences found in research between high worry and clinical anxiety is the experience of distress and control. Those suffering with GAD find their experience of worry distressful, causing impairment to their lives in some significant way, and out of their control, whereas others with high worry (but no GAD diagnosis) feel less distressed, impairment, and more control over their worrying. Furthermore, Ruscio and Borkovec (2004) found that another major distinction was that non-GAD high worriers found worry to be a positive thing, whereas those with GAD found it to be dangerous and harmful.

PC and CV health. Empirical evidence has shown the cause and effect nature of cognition, and especially negative cognitions, like high levels of PC, on one's physical health (McCubbin et al., 2011; Brosschot et al., 2006; Digdon & Koble, 2011). Furthermore, those who have high levels of perceived stress are more susceptible to experiencing a lack of CV recovery following acute stressful events (Pieper & Brosschot, 2005). For example, Verkuil et al. (2009) found that those who were high trait worriers (as measured with the Penn State Worry Questionnaire, or PSWQ) had slower heart rate (HR) recovery following a stressor task involving an intellectual analogy test than those who were low worriers. However more reactive CV responding to stressful situations is only part of the issue for those who are high in PC. In addition to being more reactive to acute stressors, those who are high PC also tend to require a longer period of time to recover following the termination of said stressor, thus suffering from what is known as prolonged recovery (Pieper & Brosschot, 2005). Pieper and Brosschot (2005) note two additional types of prolonged activation, that is also, a time at which the stressor is recreated in one's mind, (i.e., rumination), and finally anticipatory responding to stressful activities (i.e., worry) as well. Some studies have actually indicated that prolonged physiological activation is more predictive of long term CV issues than acute reactivity (Pieper & Brosschot, 2005). These instances of prolonged activation, reactivation during rumination, and anticipatory activation are thought to increase one's "risk load" and over time be the theoretical link to increased CV disease; this often referred to as allostatic load (McEwen & Seeman, 1999). Pieper & Brosschot (2005) also note that the presence of negative (and less positive) emotionality (e.g., hostility, depressive affect, and anxiety) immediately following stressful events as well as more negative emotion by disposition, were each predictive of future CV and other chronic diseases.

Theoretically, one's goal, therefore, would be to cope with the stressor via elimination, avoidance, or changing it (Pieper & Brosschot, 2005) subsequently mitigating the stressor and allowing for CV recovery to occur. Theoretically, increased CV reactivity to stress-inducing events repeatedly over time and for prolonged periods of time may become pathologic to the CV system based on both correlational and empirical research (Brosschot et al., 2010, Ottaviani et al., 2016). Thus failure to engage in effective coping, or to make changes related to dysfunctional cognition related to excessive PC may lead to hypertension, heart attack, or even stroke (Franzen et al., 2011; Gillie & Thayer, 2014; Key et al., 2008; Lovallo & Gerin, 2003).

Some of the most commonly researched outcome variables used as indicators of CV responding/reactivity is systolic BP (SBP), diastolic BP (DBP) and HR since one of the biggest risk factors of poor coping is hypertension (Gerin, Davidson, Christenfeld, Goyal & Schwartz, 2006; McCubbin et al., 2011), or a condition in which the pressure in one's arteries is considered too high and thus pathological to the individual's health status (AHA, 2014). Therefore, one of the main foci of many lines of research in health psychology is determining how to a) prevent hypertension in the first place and b) treat it with effective coping techniques designed to help the individual relax which in turn may 1) reduce initial BP reactivity to an acute stressor, and also help BP/HR recover quickly once the stressor is no longer present. Some of the classic ways investigators have looked at this problem is by testing the effectiveness of relaxation techniques like deep breathing via meditation (Brown Wright, Gregoski, Tingen, Barnes, & Treiber, 2011), listening to music (Chafin, Roy, Gerin, & Christenfeld, 2004), and a most novel method, the use of SSLAs, or already salient, enjoyable activities as a means of increasing adherence to stress-reducing activities for relaxation and BP management (Zawadzki, Smyth, Merritt, & Gerin, 2013).

For example, a study conducted by Gerin et al. (2006) investigated the use of distraction (versus no distraction) following an anger-recall stress task to determine if distracting stimuli in one's environment (multicolored posters on a wall, magazines, puzzles, toys all within reach) assisted with BP recovery to anger recall. Gerin et al. (2006) found that those who were high trait ruminators showed the poorest BP recovery of all participants. Cooper, Thayer, & Waldstein, (2014) found in a sample of African-American woman that utilization of prayer helped the recovery of state feelings of stress, and also decreased DBP response during and following a racism stressor task.

A great deal is understood regarding the CV risk of not only increased instances of BP reactivity, but also the failure to recover quickly from stressful events on long term CV health outcomes (McCubbin et al., 2011; Brosschot et al., 2006; Digdon & Koble, 2011). More recently, studies have focused on developing effective coping techniques to help modulate that risk (Zawadzki, Smyth, Merritt, & Gerin, 2013). However, not as frequently investigated is the use of techniques (like rational disputation) to not only cope with stressors after they have occurred, but rather, positively enhance (reduce worry, rumination, negative affect of events) one's appraisal of events in general, as a means of proactively modulating the perception of the event itself, and perhaps in turn reducing the sheer number of events perceived as stressful in the first place, thus in turn having less to cope with after the fact. In other words, if one experiences less worry and rumination (and thus psychological stress) to begin with, one's risk for CV health concerns over time will inherently decrease.

Cardiovascular Reactivity and Irrational Beliefs

A few of the leading experts in REBT published a study that tested the effects of rational and irrational beliefs on BP, HR, and anxiety in order to determine the physiological and

psychological disturbances related to holding an irrational versus a rational belief (Harris et al., 2006). For this study, participants (90 patients between the ages of 18-64 from a London hospital being seen for a regular check-up) had their BP, HR, and respiration rate measured as part of their normal, general practitioner check-up experience (Harris et al., 2006). Following, the participant was randomly assigned to one of three conditions in which all participants were seated in front of a camera and told that they should hold as still as possible for 1 minute and that their ability to do so would be judged and rated by a panel of 10 behavioral experts who would give them a performance score based on various facial movements, expressions, etc. (Harris et al., 2006). A third of the participants were in the 'rational belief' group and were asked to think, "I would prefer to perform well in this presentation, but I don't have to. If I don't, then I would not like it, but I would not be less worthy for my performance" (Harris et al., 2006, p. 105). The irrational belief group was asked to think, "I must perform well in this presentation. If I don't, then I'm a failure!" (Harris et al., 2006, p. 105) Finally, those in the neutral belief group were asked to think, "I don't care how I perform in this presentation" (Harris et al., 2006, p. 105). After this, participants were asked to rate changes in their anxiety and level of concern as well as their level of conviction. Participants also had their BP, HR, and respirations measured a second time immediately following the experiment (Harris et al., 2006).

Researchers found that the type of belief (i.e., irrational, rational, or neutral) had significant effects on increases in participant anxiety and concern and those who held irrational beliefs showed the greatest increase in anxiety whereas those holding rational beliefs showed the biggest increase in concern (Harris et al., 2006). Systolic and diastolic BP measurements increased for all three groups however those holding irrational beliefs showed the greatest increase in systolic and diastolic BP from pre to post measurement periods. Those with a rational

belief showed a significant decrease in systolic BP and those in the neutral belief group showed no significant change in BP (Harris et al., 2006). There were no significant differences between the belief groups in HR or respiration rate (Harris et al., 2006).

This experiment is the most modern (and one of the few in existence) to test the relationship between CV responding and beliefs and thus can be utilized as a precedent for the current study. However it is not without its limitations. For example, CV measurements were only taken pre and post experimental manipulations and the authors did not note the length of time between pre-test measures and post-test measures. Furthermore, studies have shown that BP and HR can fluctuate over a short period of time (Thayer, Åhs, Fredrikson, Sollers, & Wager, 2012), both naturally and when experimentally manipulated. Thus, since this short protocol did not capture a continuous measurement of CV responding intermediate and potentially important changes were not documented. Also, this study required that the participant adopt a belief that may not have been personal to them. In other words, the participant was asked to hold a belief that they may have not have *truly* endorsed, despite what their ratings of conviction were. As evidenced in a study by Merritt, Bennett, Williams, Sollers III, and Thayer (2004) personally-relevant stressor tasks (e.g., an anger recall task talking about, for example, experiences of racism) in a laboratory setting are effective in inducing strong CV responding and thus an evocative option for lab-based studies. Finally, this study missed an opportunity to also consider the participants' mood in order to measure emotional change pre and post experiment to assess if holding a rational (versus irrational or neutral) belief made them feel happier.

Current Study

The current study was developed out of the need to explore the utility of a brief rational disputation exercise after a worry-recall task for those with high PC in order to determine its

benefits on CV and mood (including state anxiety) recovery to worry recall. This exercise based in REBT theory is designed to be quick, efficient, yet impactful, especially for those who have a tendency to ruminate and worry heavily. Research indicates that there are serious psychological and physiological long-term ramifications for those with high PC when left untreated including and not limited to depression, anxiety (Ellis et al., 1997), sleep dysfunction (Chen, Gelaye, & Williams, 2014; Israel et al., 2012; Nicassio, Mendlowitz, Fussell, & Petras, 1985; Merritt et al., N.d.), and poor CV functioning (Thayer et al., 2012).

This study is important due to the gaps in the REBT research literature, (Sharp & McCallum, 2005; Hyland, Adamson, & Boduszek, 2015) including the lack of experimentally manipulated components of REBT, specifically regarding the ABC(DE) model, and previous studies specifically neglected the impact of REBT and/or its components on physiological responding. This study covered a task that other studies (Sharp & McCallum, 2005) did not undertake, (i.e., evaluated a specific and experimentally controlled) therapeutic component of REBT.

As previously mentioned, it is commonplace for therapists to utilize multiple disputation strategies and styles within a session with up to 16 different combinations of possible disputation scenarios (see Figure 1), however this writer could not find a study that isolated and tested any combination of said strategies and styles, a point that makes this dissertation unique. Furthermore, as David et al. (2010) keenly noted, previous studies of REBT have failed to investigate personally-held, core beliefs and how they affect psychophysiological outcomes. This study did just that; instead of contrived and proscribed hypothetical situations made up by the experimenter and given to the participant to induce worry/rumination as a means of manipulating a CV response, this study allowed for the participant to recall (think and talk about) a

personalized a) worrisome event, i.e., the thing that worries the participant most at this current moment and b) the participant's personally chosen rational disputation (see 'styles of rational disputation' section above) to their expressed IBs.

This study is innovative as it has added valuable preliminary evidence to the breadth of REBT research. In turn, that evidence may ultimately provide the framework for a brief and easy-to-use method of psychosocial intervention for sub-clinical patients/clients with cardiac care needs, and others with stress and coping skills training needs as well. Ellis himself noted, "Unless more vital, important, and in some ways crucial research on REBT theories and practices is done, this pioneering form of CBT will suffer, and what well may be less effective forms of CBT may prevail. Somebody – Including I – had better do something about this" (Ellis, 1996, p. 97)!

Aims and Hypotheses

Aim 1: Determine the psychosocial and behavioral traits associated with PC.

- Hypothesis 1: Those with high PC will report significantly greater striving behavior, self-efficacy, perceived stress, desire for control, and poor sleep quality than those with low PC.
- Hypothesis 2: Those with high PC will report significantly more anxiety and depression than those with low PC.

Aim 2: Determine whether a rational disputation exercise is effective in enhancing CV recovery following a worry-recall task.

- Hypothesis 3: Those in the experimental group (i.e., completing a rational disputation exercise) will experience significantly greater BP and HR recovery immediately

following the manipulation task (see Figure 2) than those in the control group (i.e., sitting quietly in a chair).

- Hypothesis 4: Those in the experimental group will experience greater BP and HR recovery at the end of the experiment than those in the control group.

Aim 3: Determine whether a rational disputation exercise is effective in enhancing affect recovery and reducing state anxiety levels following a worry-recall task.

- Hypothesis 5: Those in the experimental group will report significantly more positive affect and less negative affect than the control group following the manipulation period.
- Hypothesis 6: Those in the experimental group will report significantly more positive affect and less negative affect after the Worry-Recall (WR) Talk 2 task (see Figure 2) than the control group.
- Hypothesis 7: Those in the experimental group will report less state anxiety at WR Talk 2 than the control group.

Aim 4: Determine whether participants will continue to practice the rational disputation exercise during the 7 day follow-up period and if it increases self-reported coping with worry.

- Hypothesis 8: More participants will use rational disputation during the 7 days than not.
- Hypothesis 9: More participants assigned to use rational disputation will self-report an increased ability to cope with worry than not.

Method

Participants

Participants consisted of a convenience sample of undergraduate Psychology students from a medium-sized, mid-western, urban university. A total of 341 college psychology students (see Figure 3), between the ages of 18-34 (M = 21.18, SD = 3.23) were eligible for data analysis.

Of those participants, 49 (14.4%) were men. 95.6% (n = 326) of survey takers categorized themselves as undergraduates between freshman and senior classification and 4.4% (n = 15), and categorized themselves as graduate students or "other" in classification. 68.6% (n = 234) identified themselves as Caucasian/White.

On this survey, participants completed assessments of PC, other pertinent psychosocial traits (see Materials section below), health history, and a qualitative segment inquiring about what the participant worried about most. Since those with high PC are at substantially higher risk for CV diseases and psychological concerns, only those with high PC were recruited for the lab visit of this study. To qualify, participants must have reported high levels of PC, i.e., a score of 99 or higher on the PC construct. This score has been utilized previously in similar research investigating PC and laboratory measures of CV responding and was found to be a useful quantification of high PC (Di Paolo, 2013).

Exclusionary criteria. For the laboratory portion of this study, exclusionary criteria included Psychology graduate students due to the likelihood of these participants being privy of psychological experimentation procedures, thus potentially introducing confounding biases to the manipulations of this study. Also excluded were those with major health history concerns that may interfere with BP readings and/or affect/anxiety responding including: a diagnosed cardiovascular disorder, a current or recent (within the last year) diagnosis of a psychological disorder, and/or those who were currently engaged in psychotherapy of any kind, as these factors may have unduly affected the manipulations of this study. Those with scores on the CESD-R (see Appendix C-6) that indicate "possible major depressive episode" or higher ("probable major depressive episode" or "meets criteria for major depressive episode"), i.e., at least two (up to four reported symptoms occurring nearly every day for two weeks or 5-7 days during the past

week, and the endorsement of symptoms of anhedonia or dysphoria "nearly every day for two weeks" (Eaton, Muntaner, Smith, Tien, Ybarra, 2004) were excluded due to the potentially confounding factor of an undiagnosed Major Depressive Episode (Lewinsohn, Seeley, Roberts, & Allen, 1997) again, as a means of controlling for the potential confounding effects this diagnosis may have on the outcomes of this study. None of these participants were ineligible due to medical health history, e.g., cardiovascular concerns like hypertension. Finally, those who presented in the lab with a resting, casual BP in the hypertensive range in accordance with the American Heart Association (AHA) guidelines (AHA, 2014) i.e., an average reading above 140 SBP or 90 DBP, would have been excluded, though compensated for their time.

Final sample. Of the total number of survey takers, 341 surveys (49 men, 292 women) were analyzed (see Figure 3) for data analysis. 62 were eligible for (4 men, 58 women) and contacted to participate in the lab visit. In total, 32 participants arrived to the lab to complete the visit and 30 actually completed the visit fully. No participants were excluded due to hypertensive BP readings, however two participants divulged during the written informed consent period (prior to start of experiment) that they had psychiatric diagnoses (OCD, and self-arm behaviors within the last year due to major depressive disorder) though due to the fact that they were not currently receiving psychotherapy or other treatment, these individuals did not trigger the exclusionary criteria above. These participants were thanked and compensated fully for their time, and dismissed from participation in the lab visit.

One participant's data was removed from data analysis for admitting during the lab visit that she had lied while completing her survey. This participant was released from participation approximately half way through the lab visit, but compensated fully for her time. No participant was eliminated due to elevated casual BP readings as measured with the OMRON BP device.

Of those 29 participants, only 2 males completed the lab visit. Due to the underrepresentation of men in the lab portion of this study, those 2 participants' data were eliminated from the analyses of the remaining parts (parts 2 and 3) of this study. This underrepresentation in the number of men reporting high PC is supported by the findings of Nolen-Hoeksema (1987) who also found that women not only experience more depressive symptomatology than men, but women also report greater rumination than men. Knepp and Friedman (2008) note also that there are measurable HR differences in men and women in that women tend to have a higher HR than men. Therefore, the final sample of participants for the remaining parts of this study was 27 (13 experimental group, 14 control group), all women participants.

The final sample of in-lab participants (see Table 3) were between the ages of 18-22 (M = 20.0, SD = 1.3). 8 (30%) reported being: Freshman, 7 (26%) Sophomore, 4 (15%) Junior, and 8 (30%) of Senior college classifications. 18 (67%) of the participants reported being Caucasian/White, 3 (11%) Asian, 2 (7%) African-American/Black, and 1 (4%) Hispanic. There were no significant differences found between age, race, or college class representation of the survey sample, experimental, or control group.

Participants were compensated for their participation with one hour of extra credit allocated to a psychology course of their choosing for completion of the online survey, and two hours of credit, one hour each respectively, for the laboratory and 7-day follow-up portions of this study. Those who completed the lab visit also received a small gift, a stress-ball keychain, for their time and effort. There was no financial compensation for this study.

Materials and Procedure

Study design. This study had three major parts: an online survey, a lab visit, and a 7-day follow-up assessment. All aspects of the protocol were evaluated and approved by the UWM Institutional Review Board prior to the commencement of this study. The laboratory portion of this study consisted of one independent variable, i.e., manipulation type, with two levels: experimental group and control group. The experimental group completed a brief rational disputation exercise (see procedure section below) and the control group sat quietly in a chair. Both manipulations lasted 8 minutes and the CV recording session lasted approximately 42-45 minutes in total. This study had a mixed-model design where both between and within group statistical testing was performed.

Online survey software. Prior to being invited for a lab visit, those who wished to participate in this study first accessed an online survey via SONA systems, an online extra credit tracking software. Participants were able to select this study voluntarily among a list of other studies also listed on SONA. The online survey took about 60 minutes to complete and the goal of this survey was to find participants who qualified as being within the range of high PC and also did not meet any of the exclusionary criteria. The participant was able to click on a link located on SONA to access the online survey hosted by the online survey tool, Qualtrics. This survey consisted of a number of psychosocial questionnaires to verify the participant's eligibility.

Perseverative Cognition Construct Questionnaires

Ruminative Response Scale (RRS). The RRS measures persistent reflection on negative or depressing events and related feelings and is also associated with various CV risk profiles (Brosschot et al., 2009; Gerin, et al., 2006; Johnson, Lavoie, Bacon, Carlson, & Campbell,

2012). The 22-item assessment was originally a subscale to the Response Style Questionnaire (Topper, Emmelkamp, Watkins, & Ehring, 2014) and is an assessment of trait rumination. This measure includes a response scale that ranges from 1 "almost never" to 4 "almost always" (see Appendix C-4). Among diverse adult and adolescent normal and clinical samples, RRS total scores correlate with depression, hostility, and temperamental anger coping but correlates less so with measures of worry. Higher scores represent more rumination (and by extension, PC). One study found internal consistency of items of $\alpha = .92$, as well as a test-retest reliability of $r = .75$ (Calmes & Roberts, 2007). This study showed an internal consistency for all 22 RRS items of $\alpha = .95$.

Penn State Worry Questionnaire (PSWQ). Molina and Borkovec (1994) refer to worry as a fairly uncontrollable, negatively-valenced sequence of thoughts and images that signify an effort to engage in cognitive problem-solving on a particular subject or event that has the possibility of adverse results. The PSWQ (see Appendix C-5) assesses trait worry in normal adults and is independent of measures of depression and anxiety. The PSWQ was used in the present study for the purposes of creating a construct of PC total. The 16-item scale includes responses that range from 1 "not at all typical" to 5 "very typical of me." One study found that the PSWQ had an internal consistency of $\alpha = .93$ as well as adequate test-retest reliability in a college sample (Brown, Antony, & Barlow, 1992). The current study showed an internal consistency for all 16 PSWQ items of $\alpha = .92$.

One study found that PSWQ and RRS total scores were weakly correlated, suggesting that the constructs are independent (Molina & Borkovec, 1994). Thus, the RRS and the PSWQ were summed to form a single index with higher numbers indicating more PC and a score of greater than or equal to 99 being the criteria to be met to qualify participants for the lab visit of

this study. For the purposes of survey data analysis, e.g., regression, *t*-tests, etc., *Z* scores were determined for the RRS, the PSWQ and the average taken to form the PC total construct, which hence forth will be referred to as 'PC total'. This construct has been used in many well-established research studies (Verkuil et al., 2009).

Additional Psychosocial Assessments of Interest

Center for Epidemiologic Studies-Revised (CESD-R). Depression will be measured using the CESD-R scale. The CESD-R includes 20 items (see Appendix C-6) scored on a 4-point Likert scale where scores can range from 0 to 3. Response options are based on experiences over the past week, (and as long as two weeks) and range from "Not at all or less than 1 day last week to "Nearly every day for two weeks" Questions on this survey address somatic and psychological symptoms that may qualify an individual as having a major depressive episode per the DSM-5 criteria (APA, 2013), including but not limited to, "My appetite was poor" and "I could not shake off the blues." Scores that range between 0-16 indicate no clinical significance of depressive symptomology. Scores of at least 16, but do not meet more severe criteria, indicate a subthreshold level of depressive symptoms. To meet criteria for "possible" or "probable depressive episode", one must experience anhedonia or dysphoria "nearly every day for the past two weeks" and an additional 2, or an additional 3 symptoms respectively, that have occurred every day for two weeks, or 5-7 days in the past week (Eaton et al., 2004). To qualify as "meeting criteria" for a major depressive episode, one must experience anhedonia or dysphoria nearly every day for two weeks, and four symptoms occurring nearly every day for two weeks (Eaton et al., 2004).

Overall depression scores have shown acceptable reliability, test-retest consistency, and construct validity in previous studies of community samples (Van Dam & Earleywine, 2011;

Geisser, Roth, & Robinson, 1997). This study showed an internal consistency for all 20 CESD-R items of $\alpha = .92$.

The John Henryism Scale (JHAC). This scale (see Appendix C-12) was designed to measure high striving behavior, (sometimes referred to as active coping) characterized by mental and physical vigor, unrelenting commitment to working hard, and hyper-focused determination (Merritt et al., 2011). JHAC has been found to be related to health behaviors, life satisfaction, and CV risk under certain conditions (Merritt et al., 2011) which is why it relates well to the current study. This is a 12-item questionnaire with a Likert response scale ranging from 1 "completely true" to 5 "completely false." The higher the scores on this scale signify higher striving personality. This study showed an internal consistency for all 12 JHAC items of $\alpha = .84$.

The General Self-Efficacy Scale (GSES). General self-efficacy (see Appendix C-11) can be conceptualized as one's perception that one can handle life's stressful hassles successfully (Jerusalem & Schwarzer, 1992). Ruiz (2014) found that GSE mediated the role of psychological inflexibility on anxiety sensitivity which is fitting for the purposes of this study, to determine if a similar effect occurs to those with high PC. This scale consists of 10 items that range in answer choices from 1 "not at all true" to 4 "exactly true" and entails questions like "I can usually handle whatever comes my way" and "I can solve most problems if I invest the necessary effort." This scale has strong internal consistency, ranging between $\alpha = .76 - .90$ (Schwarzer, 1994). Convergent validity was found with measures of dispositional optimism and favorable emotions (Schwarzer, 1994). This study showed an internal consistency for all 10 GSE items of $\alpha = .91$.

The Desirability of Control Scale (DOCS). This scale was utilized in this study to observe any relationship between desire for control and PC. This 20-item assessment (see

Appendix C-8) utilizes a 7-point Likert scale with 1 representing "this statement does not apply to me" and 7 representing "this statement always applies to me." This assessment contains questions like, "I prefer to be a leader and not a follower" and "I enjoy having control over my own destiny" and reversed-stated items like "Others usually know what's best for me" and higher score indicate wanting more control over one's life. Burger and Cooper (1979) reported that the normative mean score of a college student population is 100 with a standard deviation of 10. Burger and Cooper (1979) also found good internal consistency and test-retest reliability of $\alpha = .80$ and $r = .75$ respectively. This study showed an internal consistency $\alpha = .81$.

Perceived Stress Scale (PSS). The PSS is used frequently in stress research and its content is related to assessing an individual's perception and interpretation of the level of stress in their life. For example, the PSS (see Appendix C-13) asks participants to answer questions about how often they have felt a certain way in the last month utilizing a 5-point, Likert scale ranging from 0 "Never" to 4 "Very often". For example, "how often have you felt nervous and stressed?" and "how often have you found that you could not cope with all the things you had to do?" The 10-item scale has been found to have an internal consistency of $\alpha = .89$ (Roberti, Harrington, & Storch, 2006). This study showed an internal consistency for all 10 PSS items of $\alpha = .82$.

Brief COPE. This scale is frequently used in research to measure the manner of which a person is coping with troubling or stressful events. The Brief COPE (see Appendix C-9) is a condensed version of its predecessor, the COPE (Carver, Scheier, & Weintraub, 1989), and was reduced from 60 items to 28 items for reduced participant burden. Participants answer each item utilizing a scale of 1 representing "I haven't been doing this at all" and 4, "I've been doing this a lot" in regards to statements like, "I've been trying to come up with a strategy about what to do"

and “I’ve been trying to see it in a different light, to make it seem more positive.” This particular assessment will be used in this study for the purposes of determining whether or not style of coping affects PC levels. For example, it is possible that those with poor coping techniques (i.e., higher scores on the COPE Denial subscale) experience higher levels of PC. The benefit of this assessment was that the experimenter may change the language of the instructions to relate to the applicable situation. For the purposes of this study, the instructions were adjusted to read, “Please complete the following questionnaire regarding the thing you worry most about discussed above” in reference to the online survey format.

This scale has 14 subscales, all containing 2 items each, and all showing good internal consistency, α = .54 - .82. The author notes that one can use any, some combination, or all subscales in applicable research (Carver, 1997). The denial and positive reframing subscales were used for the purposes of this study as indicators of cognitive coping. Those scales showed internal consistency of, α = .68 - .80, respectively.

Generalized Anxiety Disorder (GAD)-7. The Generalized Anxiety Disorder – 7 was developed in 2006 to assess GAD symptoms in a brief yet effective measurement tool (see Appendix C-10) for both clinical and research settings (Spitzer, Kroenke, Williams, & Lowe, 2006). Research indicates that clinical GAD correlates with measures of PC (Borkovec et al., 1998). Initially, this scale was developed using the DSM-IV symptom criteria for GAD as well as a few additional questions in line with other assessments of anxiety (Spitzer et al., 2006) and thus will be an important clinical indicator for this study proposal. This assessment asks participants to respond to 7 items on a 4 point Likert scale consisting of “0” Not at all to “4” Nearly every day for how often they have been bothered by problems over the last two weeks (Spitzer et al., 2006). Questions on this scale consist of, for example, how often have you

"worrying too much about different problems" and "feeling nervous, anxious, and on edge." Spitzer et al. (2006) report good internal consistency of items as α = .92 and test-retest reliability of r= .83. The GAD-7 was found to have an 89% sensitivity when compared against those with diagnosed GAD at the 10 point cut off score (Swinson, 2006).

Lowe et al. (2008) normed data for a general population (i.e., non-clinical) and found that on average, women scored higher than men, i.e., women, *M* = 3.2, *SD* = 3.5 and men, *M* = 2.7 *SD* = 3.2. 1% of the population sampled (N = 5,030 adult men and women, age, *M* = 48.4 SD = 18) scored at or above 15.

Spitzer et al. (2006) note that at a score of 10 or higher, sensitivity is maximized at .80 and most GAD patents score at or above 10 while those without GAD score below 10. The authors also note that cut scores of 5, 10, and 15 may be used as indicators of mild, moderate, and severe GAD (Spitzer et al., 2006). This study showed an internal consistency for all 7 items of α = .92.

Pittsburgh Sleep Quality Index (PSQI). The PSQI is a well-utilized tool (see Appendix C-7) in sleep research, as well as many other areas of psychological focus (e.g., stress and coping) as a means of investigating the relationship between stress, PC, and health outcomes. PSQI scores range from 0 – 21 with higher scores representing worse sleep quality (Buysse, Reynolds III, Monk, Berman, and Kupfer, 1989). The PSQI has seven component scores which are added together to form a total score, and Buysse et al. (1989) reported α = 0.83 overall reliability between components. Test-retest reliability was conducted and Buysse et al. (1989) and found no significant differences between time 1 and time 2. Validity was ascertained utilizing individuals suffering from the Disorders of Initiating and Maintaining Sleep (DIMS) and it was determined that DIMS patients had significantly higher scores on the PSQI than

controls (normal sleepers) did (Buysse et al., 1989). This assessment contains a range of questions relevant to sleep quality including, "…what time have you usually gone to bed at night" and "do you have a bed partner or roommate" and if the person experiences pain, bad dreams, or snoring related to the last month and with anchors of 0 representing "not during the past month" and 3 representing "three or more times a week."

Finally, Buysse (1989) reports that a PSQI total score of > 5 is representative of a "poor sleeper" relative to other subjective and objective sleep measures used for validating this tool. This study showed an internal consistency for all 18 scaled PSQI items of $\alpha = .83$. The following three component scales show inter-item reliability as follows: (1) sleep disturbance, $\alpha = .83$, (2) sleep latency $\alpha = .83$, (3) daytime dysfunction, $\alpha = .83$. The remaining four scales: (4) duration of sleep, (5) sleep efficiency, (6) overall sleep quality and (7) needs medication to sleep are all single item subscales.

Pre-Sleep Arousal Scale (PSAS). This scale will be utilized as another indicator of the relationship between stress, PC, and health behavior. This scale (see Appendix C-14) is comprised of a total of 16 items, half of which are considered somatic items and the other half cognitive items with a theoretical minimum score of 8 and maximum score of 40 for each of the two subscales. Normative means and standard deviations on the cognitive subscale in a college sample was 12.80(2.75) for normal sleepers and 25.50(6.57) for those suffering from insomnia. On the somatic scale, means and standard deviations for normal sleepers was 11.17(3.99) and 17.67(6.45) for those suffering from insomnia (Nicassio et al., 1985).

This survey contains questions related to "pre-sleep period last night, did you experience any of the following…" which makes it a valuable acute measure of pre-sleep arousal related to cognitive (e.g., worry/rumination) and somatic symptoms. Participants will answer these

questions utilizing a 5 point Likert scale where 1 represents "not at all" and 5 represents "extremely". An example of the somatic question on this survey are, "heart racing, pounding…" or "tight tense feeling in your muscles" whereas the cognitive questions, ask, for example, "worry about falling asleep" or "can't shut off your thoughts." This study showed an internal consistency for all 16 PSAS items of $\alpha = .94$.

In Lab Assessments and Materials

Affect assessment. During the laboratory visit, a momentary "mood" scale (MMS) was utilized (see Appendix A-2) to assess emotional reactions over the course of the lab visit. Four times at pre-designated periods (see procedure below) the participant completed a 15-item inventory with a 5-point Likert response scale, 0 = "not at all" to 4 = "very much." The MMS asked participants to rate the presence of each of the 15 negatively or positively-valenced items (e.g., depressed, content, happy, tense, annoyed, and angry) at that exact moment in time. An average composite score of the positive and negative affect based on Cronbach's alpha measure of internal consistency was done to assess positive and negative affective constructs. Composite affective scores is a commonly utilized method of analysis in laboratory research (Atienza, 2001; Kwan & Bryan, 2010). This study showed an internal consistency for the positive affect items of $\alpha = .84$ (i.e., content, happy, strengthened) and the negative affect items, $\alpha = .58$ (i.e., annoyed, frustrated, sad, powerless, hopeless, depressed, disgusted, ashamed) for the baseline assessed affective states.

State Anxiety Inventory (STAI) – 6. The long form STAI consists of 20 state and 20 trait anxiety items, however it is cumbersome to administer in certain studies and thus the STAI-6 item scale was developed (Marteau & Bekker, 1992). For the purposes of this study, the STAI-6 (see Appendix A-3) was utilized as a validated measure (Tluczek, Henriques, & Brown, 2009;

Perpiñá-Galvañ, Cabañero-Martínez, & Richart-Martínez, 2013) of participant's state levels of anxiety over the course of the lab visit. As a means of attempting to reduce participant burden, this measure was be utilized at three time points (see procedure below) instead of four time points like the MMS affect scale.

Participants were asked to respond to each item on the scale regarding how they felt right at that moment via questions like, "I feel calm" and "I am worried" on a 4 point Likert-type scale ranging from 1 "not at all" to 4 "very much." When compared against the long form, the STAI-6 yielded r =. 95. The STAI-6 also yielded an internal consistency of α = .82 (Marteau & Bekker, 1992). To score the STAI-6, one must prorate the scores to reflect the range of scores for the original 20 item scale. The range of scores for the 20 item STAI are a theoretical minimum of 20 and a maximum of 80 (Marteau & Bekker, 1992).

Marteau and Bekker (1992) note that to test for sensitivity, the STAI-6 and STAI-20 was administered to pregnant women who just received an abnormal blood test that screens for spina bifida and Down's Syndrome. The average score on the STAI-6 was 47.7 whereas the mean score for the 20 item STAI was 46.4 which the authors note is a non-significant difference. Comparatively, the mean on the STAI-6 for a sample of pregnant woman at their doctor's office for a routine checkup was 37.1 and a standard deviation of 11.

Manipulation check. Immediately following the completion of the lab visit, participants were given a manipulation check (see Appendix A-4) to inquire about their experience in either the experimental (10 questions) or control group (7 questions). This assessment consisted of questions regarding how well they understood what they were asked to do, how much they enjoyed it, how focused or absorbed they were during the activities of the lab visit, how much they believe they would use it in the future (experimental group only), etc. Participants answered

each question using a 5 point Likert-type scale rating their experiences from 0 “Not at all” to 4 “An extreme amount.”

Rational Disputation Exercise (ABC) Worksheet. This worksheet was modeled closely after a worksheet developed by Ellis and colleagues for use by the therapist and client during an REBT therapy session or as homework for the client to work on in their own time (Ellis et al., 1997). This form (see Appendix A-5) had five columns labeled respectively: (A) Activating Event/Problem, (B) Significant Beliefs, (C) Emotional/Behavioral Consequences, (D) Disputation - New, helpful belief, and (E) Effective emotional/behavioral consequences. This form was approximately 3 inches in width by 8 inches in length and filled out by the experimenter as the participant talked about the event that worried them most. The worksheet was given to the participant to use during the following 7 days as a reference that was purposely designed for easy transportability, e.g., in one’s purse, wallet, pocket, backpack or affixed in a dominant area at home e.g., the refrigerator, one’s bathroom mirror, or in one’s bedroom. A copy was also kept by the experimenter for record-keeping purposes. Though this ABC worksheet is commonly utilized in REBT therapy (Ellis et al., 1997), its psychometric properties are unestablished.

Field Component Material

Rational disputation practice tally sheet. Participants in the experimental group were asked to continue practicing the rational disputation exercise they learned in the lab for one week (7 days) starting the same day they completed the lab visit. They were asked to practice the new belief the way they did in the lab, i.e., 1) think about the new rational belief and the possible emotional/behavioral consequences of that belief and 2) talk it over with a friend/family member if possible. This sheet (see Appendix A-5) had on one side the ABC worksheet completed during

the lab session so he/she could easily recall what was discussed during the lab visit. The tally sheet on the other side of the paper so that the participant could easily mark down the instances that they practiced the rational disputation by day.

Laboratory Devices

PORTApres. PORTApres is an ambulatory monitor used to collect continuous measures of BP and HR. The PORTApres was used to (1) establish seated baseline BP/HR levels at the beginning of the study and (2) measure the effects of in-lab experimental manipulations on BP/HR. Measures of systolic and diastolic (SBP and DBP) BP and HR were collected continuously throughout the length of the lab visit which lasted approximately 42-45 minutes.

PORTApres is an ambulatory monitor that uses the arterial clamp method (Penaz Method) to collect continuous BP and HR waveforms that are analyzed offline using proprietary software (McCubbin et al., 2011). The data was analyzed using a Modelflow technique and BEATSCOPE 1.1 software. This software uses the Wesseling Algorithm, which computes aortic flow waveform from an arterial pressure signal. Aortic diameter can be different based on age and gender demographics (Bogert, & van Lieshout, 2005; McCubbin et al., 2011).

The PORTApres was attached the participant with two finger cuffs placed on the middle phalanx of two fingers on the participant's non-dominant hand, typically the fingers that are biggest in diameter as a means of obtaining a quality HR signal. Using the non-dominant hand allowed the participant's dominant hand to be free to write with or complete assessments during the lab visit. Of note, the PORTApres also includes a height correction monitor (one lead placed on a strap at heart level and the other on one of two the fingers) that automatically corrects any BP or HR reading for any motion artifacts such as hand gestures or a coughing spell.

The PORTApres device is a validated tool of BP/HR measurement (Schutte, Huisman, van Rooyen, Malan, Schutte, 2004; Langewouters, Settels, Roelandt, & Wesseling,1998) for both research and clinical use as it has been shown to meet AAMI (Association of the Advancement of Medical Instrumentation) standards for accuracy and an overall A/B rating from the British Hypertension Society (BHS). The PORTApres has been used in a great number of studies of a similar nature investigating the role of emotions/cognition on CV responding, just to name a few: McCubbin et al., 2011; Steptoe and Marmot, 2005; Sosnowski, Bala, and Rynkiewicz, 2010; and Merritt et al., 2004.

OMRON BP monitor. The OMRON BP monitor is a standard "at-home use" BP cuff that was utilized to verify pre-study, casual, resting baseline BP to verify normal (i.e., non-hypertensive) BP readings as dictated by the AHA (2014), i.e., below a SBP of 140 mmHg and DBP of 90 mm Hg.

Logitech Webcam. Laboratory sessions were recorded (for those participants who consented) in order for a qualitative review of the experimental group manipulation period (i.e., the rational disputation exercise) to be assessed. The webcam also allowed the experimenter to "check in" with the participant remotely, while the experimenter was sitting out-of-sight of the participant to ensure that the participant was not on their phone, sleeping, or engaging in some other observable potentially engaging or distracting activity.

Procedure

Part 1: Online survey. Participants gained knowledge of this study based on in-class advertisements conducted by the laboratory research assistants and online posters posted on psychology course webpages. Students logged on to an online extra credit system, SONA Systems, and registered to complete this study. Once the informed consent process (an online

informed consent where the participant clicked "yes" to a button signifying they agreed to the terms of the study) was completed (see Appendix D-2), participants completed a one hour online survey that was comprised of questions regarding health history, demographics, and psychosocial assessments and questions determining the participant's eligibility for the next parts of the study.

Part 2: Laboratory visit. *Pre-study lab set-up.* At a prior date and time, a research assistant randomly assigned participants to one of the two groups in this study. The group assignment was concealed from the experimenter until just prior to the manipulation period at which time the experimenter opened an electronic folder kept on the lab's desktop computer prepared by the research assistant which specified what manipulation was to be carried out following the worry-recall task, i.e., experimental procedure, a rational disputation exercise for 8 minutes, or control group procedure, sitting quietly in a chair for 8 minutes. Those participants that qualified for the lab visit were contacted by this study's experimenter via phone call or email to inquire if they would like to participate in the remaining portions of this study.

In lab protocol. Once at the lab, participants were asked to put their phone on "silent" and also away (out of reach) so as to not interrupt the lab visit. The participants then read and signed an informed consent (see Appendix D-3) regarding the remaining components of the lab visit. The experimenter explained to the participant that they would like to video record the session for the purposes of further analysis of experimenter behaviors after the study is complete, however if they do not wish to be recorded, they may refuse but continue to participate without being recorded. The participant also consented for use of individualized (anonymous use) quotes that occurred during the lab visit, e.g., when the participant discussed what they worried most about, how it made them feel, what their new belief may be, and how they may feel if they

adopted the new belief, etc. Finally, the participant was informed that they may be randomly assigned to part 3 of the study, the 7-day follow-up practice, and that if they were, they would be notified at the end of the visit and instructed on what that entailed to determine if they would like to participate.

Preliminary (pre-study, baseline) assessments. The participant completed (see Figure 2) their first MMS (affect) scale immediately following the informed consent signing to assess what emotions they were feeling upon coming into the lab, prior to the initiation of any protocol. They also completed a state anxiety assessment. The participant then had three casual, sitting BP readings, with the OMRON BP cuff, spaced approximately one minute apart prior to the start of the study as a means of establishing their resting BP status.

Laboratory device set up and protocol. Next, the participant was hooked up to the PORTApres beat-to-beat BP device. Once the PORTApres was attached to the participant and she was sitting comfortably, the experimenter began recording BP/HR on the Beatscope software. The experimenter followed a script (see Appendix B-1) closely for the remainder of the lab visit to ensure all aspects of the protocol were homogeneous in nature. The experimenter instructed the participant to "…sit quietly while a baseline reading is assessed for 5 minutes." The participant was also asked not to cross her legs as it may interfere with BP/HR readings. This time period served as the "non-talking" baseline measurement of BP/HR. Next, the participant was given an easy-to-read and non-emotionally evocative passage (see Appendix B-1) to read aloud (i.e., how to wash clothes) for 2 minutes to assess changes in BP that occur when speaking. This period of time served as the "talking baseline" as it is an indication of baseline BP/HR while a participant talks about a neutral, non-worrisome event. It is important to consider both a talking baseline in addition to a non-talking baseline since talking typically induces an

increase in BP/HR regardless of the content of speech (Merritt et al., 2004). Following the talking baseline, the participant was asked to recall the event that they worry most about that they described on their online survey. The participant was asked if this was still the thing she worried most about at that moment in time. If it was not, the participant was asked what they were currently worried most about and asked to utilize that event[1] for the remaining portions of the study. This was important as a means of attempting to ensure the highest level of cognitive engagement in a worrisome event possible for the lab visit protocol. The participant was asked to think about the event the same way as they would any other time they were worrying about it (Borkovec et al., 1998) for 2 minutes. A similar instructional protocol was utilized in Metzger, Miller, Cohen, Sofka, and Borkovec, (1990). Participants were instructed to think about all the details of the event they worried about most, e.g., why it made them worry so much, what the worst part about it was and also any physical and emotional feelings they may experience when worrying about it. During the non-talking baseline, the talking baseline, and the 2 minute worry period (WR Think 1), the experimenter was seated at the research computer behind a cubicle wall and out of the sight of the participant.

After the 2 minute WR Think 1 period was completed, the experimenter turned on the Logitech video camera to record the remaining parts of the session and returned to sit in a chair placed across from the participant (approximately 4 feet away) so the experimenter and participant sat face-to-face. The participant was then asked to tell the experimenter about their worrisome event (WR Talk 1; see Figure 2) and all the things that she had just been thinking about for the next 4 minutes. The participant was allowed to continue talking past the 4 minute

[1] There was one instance of a participant changing the worrisome event from what she talked about on her survey to what she talked about in the lab.

period if they were mid-sentence. The experimenter waited for the participant to complete their sentence and then let the participant know that the 4 minutes was up.

During the 4-minute period that the participant was talking, the experimenter completed the ABC worksheet (see Appendix A-5). If the participant ran out of things to talk about before the 4 minutes was up, the experimenter kept the participant focused on the worrisome event by asking additional questions like, "Can you tell me more about [x]…" or "How does it make you feel emotionally?" Furthermore, if the participant failed to describe any one of the three "ABCs" (i.e., activating event, significant belief, or emotional/behavioral consequence) the experimenter asked the participant pointed questions, i.e., "What is a strong belief that you hold related to this event that makes this situation something you worry about?" or "Do you find you act any differently when you worry about this event? If not, that's okay too" in order to complete the worksheet. The experimenter utilized reflective listening skills (Weinberger, 2014) to articulate meaning back to the participant to ensure that the details of the participant's story were accurate. These reflective listening skills included phrases like, "So what you are saying is…" or "this event makes your feel/act [x]…" Immediately following the WR 1 period (Think 1 and Talk 1), the experimenter administered the second MMS scale and state anxiety scale to assess how she was feeling after talking about her worrisome event.

While the participant completed the affect and state anxiety assessment, the experimenter opened up the electronic folder prepared by the research assistant to find out what condition the participant was randomly assigned, i.e., experiment or control group. All pre-manipulation tasks, i.e., non-talking baseline, talking baseline, worry recall (thinking then talking), were completed by all participants in the same manner. The manipulation period began immediately following the participant's completion of the second affect and state anxiety assessments.

Experimental group manipulation protocol. For the experimental group, the experimenter utilized a script (see Appendix B-1) to begin the rational disputation exercise with the participant which took approximately 8 minutes. If the participant was still talking when 8 minutes was reached, she was allowed to finish her final sentences.

First, the experimenter thanked the participant for talking about their worrisome event. Then the experimenter let the participant know that she would like to share the details of the notes she was writing down and if it is okay, she would sit in the chair next to the participant so she can follow along on the worksheet. Following the detailed script (see Appendix B-1), the experimenter began by educating the participant on the connection between activating events (or problems in one's life), beliefs, and emotional/behavioral consequences. Then, the experimenter reviewed the details of the participant's worrisome event to verify that the details written down by the experimenter were accurate.

Next, the participant was asked to come up with a new, positive, and rational alternative belief i.e., the disputation, regarding the problem that they were worried about. The experimenter then wrote down this new belief on the worksheet and asked the participant what the new emotional and/or behavioral consequences may be as a result of adopting the new, rational belief and wrote that down on the worksheet also. The participant was given time to think and explain their thoughts and if needed, the experimenter encouraged the participant by saying, "It's okay, take your time" and/or reminded the participant what was meant by "new, alternative, helpful belief." All participants were able to come up with disputations and new, effective emotional/behavioral consequences of maintaining those new beliefs on their own. The experimenter again utilized reflective listening skills to verify understanding as the participant spoke. Following this exercise, the participant was given her third affect scale.

Next, the experimental group participant was asked to look at/review the ABC worksheet and think for the next 2 minutes (WR Think 2) about what they had just learned about the relationship between problems, significant beliefs, and emotional/behavioral consequences. Additionally, they were asked to think about their new belief and what the possible emotional/behavioral consequences may be based on what was written down, but also any new thoughts they may have on the topic. Put another way, the experimenter told the participants to "mull over" the new information they had just learned. Following that, the participant was asked to talk about (WR Talk 2) what they were just thinking about regarding their new belief for 4 minutes which may include elaborating on their new belief and how it may positively affect their lives. The experimenter utilized the same reflective listening skills and line of questions as used during WR Talk 1 period if the participant ran out of things to say. The participant was then asked complete their fourth and final affect scale and their third state anxiety scale.

Control group manipulation protocol. Those who were randomly assigned to the control group were told that the PORTApres device would "continue to take some blood pressure readings" and that the experimenter would return after that was complete. During this time, the participant would remain seated quietly while the experimenter sat again behind the cubicle wall out of sight of the participant. Following the 8 minutes, the experimenter gave the participant the third affect scale. Once the participant completed the third affect scale, the experimenter let the participant know that she wanted her to again think about the event that worried her most for 2 minutes (WR Think 2), in the same manner that she did earlier. It was okay if the participant thought of new details to the event, or simply ran through the event again in their mind. Finally, the experimenter had the participant tell her (WR Talk 2) what they were just thinking about in regards to their worrisome event for 4 minutes. They were instructed that it was okay to say the

same things they said before over again, or add on detail to the event. Affect scale four and state anxiety scale three were assessed immediately following.

For the last 5-minute period, all participants were told that the PORTApres device needed to record for 5 more minutes. This served as the BP/HR non-talking "rest" period. All participants were then given a manipulation check questionnaire (see Appendix A-4). The first seven items were the same for all participants, whereas the experimental group completed three additional items that inquired about their level of enjoyment of the rational disputation exercise, if they think they will use it again, and if they believe it to be beneficial for worrisome thoughts.

Part 3: 7-day rational disputation exercise practice. As is critical of the effectiveness of REBT in more typical therapeutic situations, homework and practice of one's new rational belief is crucial to long term cognitive restructuring (DiGiuseppe et al., 2014, Sapp, 1996; LeBeau, Davies, Culver, & Craske, 2013). However, in typical therapeutic settings, homework and practice are never considered mandatory, but rather suggestions and typically individualized per client depending on the client's particular needs and situation. Some research studies (LeBeau et al., 2013; Conklin & Strunk, 2015) have shown that homework compliance was a key factor in the long-term efficacy of CBT therapy. There currently are no standardized REBT methods of administering or assessing whether or not one has completed homework, short of simply asking the client and getting qualitative feedback (DiGuiseppe et al., 2014; Ellis et al., 1997).

At the end of the study, the experimenter explained (see Appendix B-1) to the experimental group participants how important practice was for long term benefits to occur. Participants were then asked to practice the rational disputation exercise once a day, every day, for one week's time, starting the same day they left the lab. The participant was asked to simply

replicate the rational disputation exercise as they did in the lab. That means they could think about what they learned about the relationship between problems, significant beliefs, and emotional/behavioral consequences, think about their new, rational, and helpful belief, and the emotional/behavioral consequences the may come as a result of adopting that new belief. If possible, they should also discuss, as was done in the lab, their thoughts with a friend/family member, though the main focus was to practice the new belief.

The participant was given their ABC worksheet made during the lab visit so she may keep it in a convenient place for when she wanted to practice, like her wallet or on her refrigerator for easy viewing. On the back side of the ABC worksheet was a simple table (see Appendix A-5) with seven slots labeled for each day of the week. The participant was asked to put a tally down on the sheet of paper in box that corresponded to the day of the week that she practiced immediately following her practice, if possible, but no later than at the end of the day. The participant was also told that though they only were being asked to practice once a day, they may practice as often as they would like, whenever they would like, and simply to mark down a tally each time they utilized the exercise.

The participant was explicitly asked not to lie about practicing the rational disputation exercise if they choose not to do so because they would receive extra credit upon completion of their follow up phone call, regardless of whether or not they choose to complete the practice. She was also asked not to attempt to go back after days had passed to complete the tally sheet if she had forgotten to do so due to the possibility of inaccurate retrospective data tracking.

The participant was told that they would be called in one week by a research assistant not involved in the study and asked a series of brief questions (see Appendix A-6) regarding whether or not they completed the daily practice, if she enjoyed it, if she found it effective, if she would

like to continue using utilizing the technique in the future, etc. The research assistant would not know any specific details regarding the participant's story in order to maintain confidentiality. The experimenter would have no knowledge of the answers given by the participant as to whether or not they utilized the practice until the end of the study when analyses were conducted.

Data analysis. The experimenter was blind to the results of the laboratory portion of this study as well as the 7-day follow up results until all laboratory data was collected. Online survey, laboratory, and 7-day follow-up data was maintained on excel spreadsheets and analyzed with SPSS 21 and 22.

Results

Part 1 - Survey

Participants were asked, "Are you currently engaged in therapy for a psychological concern?" and 37 (11%) answered yes. Of those who answered yes, participants were asked "For what concern do you see a therapist" and they listed the following singularly or listed more than one concern; 23 said anxiety, 16 depression, 2 Bipolar disorder, 2 eating disorder, 2 PTSD, and 5 listed various other concerns including, trichotillomania, OCD, panic disorder, stress, death of a loved one, and ADHD. When asked, "How long have you been seeing a therapist?" 18 of the 37 that answered chose over a year, 13 "between one and 12 months", and 6 "less than one month."

Participants were asked to list the thing that, "…worries you most right now" as well as rank it on a scale of 0-10 where "0" represented "not worried at all" and "10" represented "the most worried possible." Univariate analyses were conducted on 341 participant responses and it was determined that participants answered between a range of 2-10, M = 7.8, SD = 1.7, and most frequently chosen was "8" as a response.

Aim 1: Determine the psychosocial and behavioral traits associated with PC.

Bivariate analyses. Bivariate correlational analyses revealed the following relationships were significant at the $p < .001$ level. There was a positive relationship between PC total (see Table 1) and each of the two factors that made up the composite (i.e., RRS and PSWQ). PC total was also positively correlated with the following assessments: CESD-R, GAD-7, PSS, PSQI, PSAS Cognitive and Somatic Scales, and COPE Denial scales. PC total was negatively correlated with the GSE and JHAC scales. There was no significant correlation between PC Total and the DOCS or the COPE positive reframing subscale.

Multivariate analyses. Though no hypotheses were made regarding the predictive nature of the psychosocial factors on PC total a priori, the high level of significant differences found between high and low PCs and the various psychosocial measures prompted an additional analysis to more deeply investigate as well as bolster the above bivariate findings between PC total and the remaining variables. A hierarchical multiple regression analysis was performed in order to determine if PC total was predicted when the psychological traits assessed above were combined in one multiple regression model.

In order to account for key sociodemographic factors and then the relevant psychosocial measures, predictors were entered in the following three steps 1) demographic data: age, race, gender, and college classification, 2) CESD-R and GAD-7 scores, and 3) the remaining nine psychosocial factors: COPE Positive Reframing subscale, COPE Denial subscale, JHAC, PSQI, PSAS Cognitive, PSAS Somatic, PSS, DOCS, and GSES.

Table 5 shows that when demographic data is accounted for, the GAD-7 and the CESD-R assessments account for a significant ($p < .001$) portion of the model. As the GAD-7 and CESD-R scores increase, so does PC total. Furthermore, when demographics, GAD-7 and CESD-R are

accounted for, the remaining nine psychosocial factors continue to add to the overall predictive model of PC total. In the final model, as PC total increases, age decreases. As PC total increases, so too do scores on the PSS, COPE Positive reframing subscale, and PSAS somatic scale. Finally, there are significant inverse relationships between PC total and GSES and JHAC, indicated that as PC total increases, those measures decrease.

Part 2: Laboratory

Chi-square tests (and *t*-test for age) indicated no significant differences (see Table 3) between demographic variables of survey takers and laboratory participants including age, race, or college classification.

Independent sample *t*-tests indicated no significant differences existed at baseline on SBP between the experimental (M = 111.33, SD = 11.6), and control group (M = 108.3, SD = 7.0), $t(23) = .885$, $p = .386$; DBP: experimental (M = 68.1, SD = 7.7) and control group (M = 64.1, SD = 45.3), $t(23) = 1.52$, $p = .141$; or HR: experimental (M = 75.3 SD = 11.5), and control group (M = 78.8, SD = 14.8), $t(23) = -.660$, $p = .517$.

Aim 2: Determine if rational disputation is effective in enhancing cardiovascular recovery following a worry-recall task.

A series of 2 (condition) X 11(time period) mixed factorial ANOVAs were conducted separately on SBP, DBP, and HR. When the interaction was significant, independent sample *t*-tests were conducted next to determine simple effects of condition, or in other words, to determine whether group differences existed at each time point. The Bonferroni correction for multiple *t*-tests (0.05/11 = .005) was utilized on these tests for simple effects.

The preceding analyses were supplemented by a series of paired sample *t*-tests to investigate changes across select time points separately within each group for SBP, DBP, and

HR for the following four pairs of time points: From 1) baseline to the end of the WR Talk 1, 2) post WR Talk 1 to post-manipulation, 3) post-manipulation to post WR Think 2, and 4) post WR Think 2 to rest. The Bonferroni correction for multiple *t*-tests (0.05/8 = .006) was utilized on these tests for simple effects.

In the case of a non-significant interaction, significant main effects for time period were analyzed with a series of paired sample *t*-tests for repeated measures to evaluate changes across select time points as described above, but with all participants without regard to condition.

Systolic blood pressure. For SBP, there was no main effect of condition on SBP, $F(1, 25) = 1.3$, $p = .265$, $\varepsilon = .195$. There was a main effect of time on SBP, $F(10, 250) = 15.76$, $p < .001$, $\varepsilon = 1.00$. There was an interaction of time and condition on SBP, $F(10, 250) = 4.55$, $p = .002$, $\varepsilon = .940$.

Upon inspection of Figure 4, there were no differences (as expected) between groups on the first four periods (i.e., non-talking baseline, talking baseline, WR Think 1, and WR Talk 1) in SBP as the groups had not been treated differentially during these first periods of time. During the first two epochs of the manipulation period, the control group decreased in SBP and the experimental group increased. The control group showed a relatively stable level of SBP over the last two epochs of the manipulation whereas the experimental group continued to increase in SBP.

Within groups, the experimental group showed an expected steady increase in SBP in the first four time periods, those being from baseline to post WR Talk 1. Following that, the experimental group showed a plateaued level of SBP through WR Talk 1, and the first and second manipulation epoch. They increased in SBP from manipulation epoch two and three, and then plateaued again from manipulation epoch three and four. Following the manipulation

period, the experimental group decreased sharply in SBP from the forth manipulation epoch to WR Think 2. They experienced an expected increase in SBP from WR Think 2 to WR Talk 2 and then decreased in SBP from WR Talk 2 to rest. For the control group, the same pattern of steady increase was found during the first four time periods. Following that, the control group decreased in SBP from WR Talk 1 to the first manipulation epoch. The control group's SBP plateaued from the first manipulation epoch through the fourth epoch and raised slightly during WR Think 2. SBP decreased slightly WR Think 2 to WR Talk 2 and then decreased slightly again from WR Talk 2 to rest.

The impressions described above were subjected to formal statistical testing. Independent sample *t*-tests indicated that between groups, the first four time periods (see Table 5) were non-significantly different (all *t*-values $\leq$ 1.19, all *p*-values $\geq$ .247). Group differences were non-significant for the first two manipulation epochs, ($t(25) = 1.75$, $p = .093$, and $t(25) = 1.72$, $p = .098$) but were significantly different at epoch 3, $t(25) = 2.58$, $p = .016$, and epoch 4, $t(25) = 2.48$, $p = .020$. Groups were non-significantly different during the WR Think 2, WR Talk 2, and final rest periods (all *t*-values $\leq$ 1.12, all *p*-values $\geq$ .273). After making Bonferroni corrections, the two simple effects that occurred during epoch 3 and 4 no longer achieved significance.

Within groups, the experimental group showed a significant increase in SBP (see Table !6) in pair one where WR Talk 1 was significantly higher than baseline, $t(12) = -7.76$, $p < .001$. There was no difference found in SBP for pair 2, $t(12) = -1.32$, $p = .210$. There was a significant decrease for pair three, where post manipulation was higher than WR Think 2, $t(12) = 4.86$, $p < .001$. Finally, pair four was not significantly different, $t(12) = .779$, $p = .451$.

The control group (like the experimental group) showed a significant increase (see Table 6) in pair one where WR Talk 1 was significantly higher than baseline, $t(13) = -8.47$, $p < .001$.

There was no difference found in SBP for pair 2, $t(13) = 1.63$, $p = .127$, pair three, $t(13) = -.732$, $p = .477$, or pair four, $t(13) = 1.48$, $p = .162$.

Diastolic blood pressure. With regard to DBP, there was no main effect of condition on DBP, $F(1, 25) = 1.3$, $p = .264$, $\varepsilon = .196$. There was a main effect of time on DBP, $F(10, 250) = 19.64$, $p < .001$, $\varepsilon = 1.00$. There was an interaction of time and condition on DBP, $F(10, 250) = 5.09$, $p = .001$, $\varepsilon = .948$.

Upon inspection of Figure 5, there were no differences in group at each of the first four time periods (i.e., non-talking baseline, talking baseline, WR Think 1, and WR Talk 1) in DBP, as expected because the groups had not been treated differentially. During the first 2 epochs of the manipulation period, the control group decreased in DBP and the experimental group increased. The control group showed a relatively stable level of DBP over all 4 epochs of the manipulation whereas the experimental group increased in DBP during epochs 3 and 4.

Within groups, the experimental group increased overall in DBP as expected from baseline to WR Talk 1. They plateaued in DBP from WR Talk 1 through the second epoch of the manipulation, though increased in DBP from the second manipulation epoch to the third and then plateaued again from the third to the fourth manipulation epoch. Like SBP, the experimental group experienced a sharp decrease in DBP from the forth manipulation epoch to WR Think 2. DBP increased from WR Think 2 to Talk 2 as expected, and then decreased from WR Talk 2 to rest.

For the control group, DBP increased as expected from baseline to WR Talk 1. From WR Talk 1 to the first manipulation epoch, the control group decreased in DBP, and then plateaued in DBP from there on through the forth manipulation epoch. There was a slight increase in DBP

from the fourth manipulation epoch to WR Think 2, but then a decrease from WR Think 2 to Talk 2 and another slight decrease in DBP from WR Talk 2 to rest.

The impressions described above were subjected to formal statistical testing. Independent sample *t*-tests indicated that there were no differences (see Table 5) between groups on the first four (all *t*-values $\leq$ 1.21, all *p*-values $\geq$ .238) during these first periods of time. Group differences were not significant for the second manipulation epoch, $t(25) = 1.61$, $p = .119$, but were significantly different at epoch 1, $t(25) = 2.25$, $p = .034$, epoch 3, $t(25) = 2.46$, $p = .021$, and epoch 4, $t(25) = 2.44$, $p = .022$. Groups were not significantly different during WR Think 2, WR Talk 2, and final rest periods (all *t*-values < 1.30, all *p*-values $\geq$ .204). After making Bonferroni corrections, these three simple effects no longer achieved significance.

Within groups, the experimental group showed a significant increase in DBP (see Table 6) in pair one where WR Talk 1 was significantly higher than baseline, $t(12) = -10.07$, $p < .001$. There was no difference found in DBP for pair 2, $t(12) = -1.76$, $p = .104$. There was a significant decrease for pair three, where post manipulation was higher than WR Think 2, $t(12) = 4.23$, $p = .001$. Finally, pair four was not significantly different, $t(12) = 1.14$, $p = .277$.

The control group (like the experimental group) showed a significant increase in DBP (see Table 7) in pair one where WR Talk 1 was significantly higher than baseline, $t(13) = -9.05$, $p < .001$. There was no difference found in DBP for pair 2, $t(13) = 1.60$, $p = .135$, pair three, $t(13) = -1.11$, $p = .287$. There was a significant difference in pair four where WR Think 2 DBP was significantly higher than rest, $t(13) = 2.22$, $p = .044$. After making Bonferroni corrections, pair four no longer achieved significance.

Heart rate. For HR, there was no main effect of condition on HR, $F(1, 25) = 0.73$, $p = .789$, $\varepsilon = .058$. There was a main effect of time on HR, $F(10, 250) = 20.79$, $p < .001$, $\varepsilon = 1.00$. There was an interaction of time and condition on HR, $F(10, 250) = 3.72$, $p = .004$, $\varepsilon = .910$.

Upon inspection of Figure 6, there were no differences between groups on the first four periods (i.e., non-talking baseline, talking baseline, WR Think 1, and WR Talk 1) in HR as the groups had not been treated differentially. During the manipulation epochs 2 – 4, the control group decreased in HR and the experimental group increased. The control group appeared to plateau in HR over the 4 epochs of the manipulation whereas the experimental group continued to increase in HR. There did not appear to be any differences between groups following the fourth manipulation epoch.

Within groups, the experimental group increased in HR from baseline to WR Talk 1. There was a sharp decrease in HR from WR Talk 1 to the first manipulation epoch. Then, HR increased from the first manipulation epoch to the second, and then again to the third, but then decreased from the third to the forth. There was further decrease in HR from the forth manipulation epoch to WR Think 2. There was an increase in HR from WR Think 2 to Talk 2 (as expected) and then a decrease from WR Talk 2 to rest.

For the control group, there was a similar pattern of increases in HR from baseline to WR Talk 1. There was a sharp decrease in HR from WR Talk 1 to the first manipulation epoch, like the experimental group. Then, HR appeared to plateau between the first and forth manipulation epochs. HR then increased from the forth manipulation epoch to WR Think 2, increased further from WR Think 2 to Talk 2, and then decreased from WR Talk 2 to rest.

The impressions described above were subjected to formal statistical testing. Independent sample *t*-tests were conducted next to determine if differences existed at each of the 11 time

points by condition. There were no significant differences between groups in HR for the first four time periods, (all *t*-values $\leq$ .479, all *p*-values $\geq$ .636). There were also no significant differences found by condition on any of the 4 manipulation epoch periods, (all *t*-values $\leq$ 1.32, all *p*-values $\geq$ .200). There were no significant differences between groups during the WR Think 2, WR Talk 2, and final rest periods (all *t*-values < .400, all *p*-values $\geq$ .692).

Within groups, the experimental group showed a significant increase in HR (see Table 6) in pair one where WR Talk 1 was significantly higher than baseline, $t(12) = -4.58$, $p = .001$. There was a significant difference found in HR for pair 2 in that WR Talk 1 was significantly higher than post manipulation, $t(12) = 3.21$, $p = .008$. There was a significant decrease for pair three, where post manipulation was higher than WR Think 2, $t(12) = 4.23$, $p = .001$. Finally, pair four was not significantly different, $t(12) = 1.37$, $p = .195$.

As was seen for the experimental group, the control group showed a significant increase in HR (see Table 7) in pair one where WR Talk 1 was significantly higher than baseline, $t(13) = -4.21$, $p = .001$. There were significant differences found in HR for pair 2 in that WR Talk 1 was significantly higher than post manipulation, $t(13) = 5.16$, $p < .001$. There were no differences found for pair three, $t(13) = -1.76$, $p = .102$ or pair four, $t(13) = 1.80$, $p = .095$.

Aim 3: Determine if rational disputation is effective in enhancing affect recovery and reducing state anxiety levels following a worry-recall task.

The positive affect items on the MMS were averaged together to form a positive affect composite and the negative affect items were treated in kind. The items utilized for the positive affect construct were content, happy, and strengthened. For the negative affect construct, depressed, annoyed, sad, powerless, hopeless, frustrated, ashamed, and disgusted were used.

A series of 2 (condition) X 4 (time period) mixed factorial ANOVAs were conducted separately on positive and negative affect. A 2 (condition) X 3 (time period) mixed factorial ANOVA was conducted on state anxiety. When the interaction was significant, independent sample *t*-tests were conducted next to determine simple effects of condition, or in other words, to determine whether group differences existed at each time point. The Bonferroni correction for multiple *t*-tests (0.05/4 = .013 for affect and 0.05/3 = .017 for state anxiety) was utilized on these tests for simple effects. The preceding analyses were supplemented by a series of paired sample *t*-tests to investigate changes across select time points separately within each group: From 1) baseline to the end of the WR Talk 1 (for positive and negative affect, and state anxiety) 2) post WR Talk 1 to post-manipulation (positive and negative affect), 3) post manipulation to post WR Talk 2 (positive and negative affect), and 4) baseline to post WR Talk 2 (positive and negative affect and state anxiety). One additional comparison was made for state anxiety that was not made for affect: WR Talk 1 compared to WR Talk 2. The Bonferroni correction for multiple *t*-tests (0.05/8 = .006 for affect and 0.05/6 = .008 for state anxiety) was utilized on these tests for simple effects.

In the case of a non-significant interaction, significant main effects for time period were analyzed with a series of paired sample *t*-tests for repeated measures to evaluate changes across select time points as described above, but with all participants without regard to condition.

Positive affect. There was no main effect of condition on positive affect, $F(1, 25) = .309$, $p = .583$, $\varepsilon = .083$. There was a main effect of time on positive affect, $F(3, 75) = 10.63$, $p < .001$, $\varepsilon = .997$. There was a significant interaction of time and condition on positive affect, $F(3, 75) = 3.55$, $p < .001$, $\varepsilon = .994$.

Inspection of Figure 7 suggests that groups did not vary from each other during baseline, WR Talk 1, and post manipulation periods. Both groups showed similar patterns of change across the first three time points but diverged during the final time point, with the experimental group maintaining their level of positive affect and the control group showing a decrease. Within groups, the experimental group decreased in positive affect (as expected) following the WR Talk 1 period compared to baseline, however increased from WR Talk 1 to post manipulation and continued to increase in positive affect from post manipulation to post WR Talk 2 in positive affect. The control group decreased in positive affect (as expected) following WR Talk 1 compared to baseline. Controls had very little change in positive affect from WR Talk 1 to post manipulation, but decreased from post manipulation to WR Talk 2.

The impressions described above were subjected to formal statistical testing. Results of independent sample *t*-tests to evaluate group differences at each time period confirmed there were no significant differences (see Table 8) between groups on the first three periods in positive affect, baseline, $t(25) = -1.90$, $p = .070$, WR Talk 1, $t(25) = -.896$, $p = .379$, and WR Talk 2, $t(25) = .979$, $p = .337$. There was, however, a significant difference between groups at the WR Talk 2 time period, $t(25) = 3.44$, $p = .002$ with the experimental group showing greater positive affect than the control group.

For the experimental group, there were significant differences found (see Table 9) for pair one, where baseline was higher than post WR Talk 1, $t(12) = 2.87$, $p = .014$, and pair two, post manipulation period was higher than post WR Talk 1, $t(12) = -4.52$, $p = .001$. Pair three showed marginal significance where WR Talk 2 was higher than post manipulation, $t(12) = -2.11$, $p = .056$. Pair four was non-significant in difference; $t(12) = -2.09$, $p = .059$. After

Bonferroni corrections were applied ($p < .006$), pairs one and three were no longer even marginally significant.

For the control group, there were significant differences found (see Table 10) for pair one, where baseline was higher than post WR Talk 1, $t(13) = 4.13$, $p = .001$ and pair four, where baseline was higher than post WR Talk 2, $t(13) = 4.81$, $p < .001$. Pairs two and three were non-significant in difference; two, $t(13) = -1.06$, $p = .307$ and three, $t(13) = 1.83$, $p = .091$, respectively.

Negative affect. There was a main effect of condition on negative affect, $F(1, 25) = 5.60$, $p = .026$, $\varepsilon = .623$. There was a main effect of time on negative affect, $F(3, 75) = 6.35$, $p < .001$, $\varepsilon = 1.00$. There was a significant interaction of time and condition on negative affect, $F(3, 75) = 2.60$, $p = .003$, $\varepsilon = .905$.

Inspection of the Figure 8 suggests that the groups did not vary from each other during baseline, WR Talk 1, and post manipulation periods, however, they did vary, in that the control group increased and the experimental group decreased in negative affect at the WR Talk 2 time period. Within groups, the experimental group increased in negative affect (as expected) following WR Talk 1 compared to baseline. Then, they decreased in negative affect post manipulation compared to WR Talk 1 and continued to decreased further post manipulation to post WR Talk 2. The control group increased (as expected) in negative affect baseline to post WR Talk 1. They then decreased slightly in negative affect WR Talk 1 to post manipulation, however increased again in negative affect post manipulation to WR Talk 2.

The impressions described above were subjected to formal statistical testing. Independent sample *t*-tests were performed on time to distinguish between group differences at specific time periods. There were no significant differences (see Table 8) between groups on the first three

periods (i.e., baseline, post WR Talk 1, and post manipulation) in negative affect, baseline, $t(25) = .145$, $p = .886$, WR Talk 1, $t(25) = -.746$, $p = .463$, and WR Talk 2, $t(25) = -1.63$, $p = .116$. There was, however, a significant difference between groups at the WR Talk 2 time period, $t(25) = -4.01$, $p < .001$.

There were significant differences found (see Table 9) for the experimental group for pair one, where post WR Talk 1 was higher than baseline, $t(12) = -3.72$, $p = .003$. Pair two was also significantly different, where WR Talk 1 was higher than post manipulation, $t(12) = 5.16$, $p < .001$. For pair three, post manipulation was higher than post WR Talk 2, $t(12) = 2.38$, $p = .035$ and for pair four, post WR Talk 2 was higher than baseline, $t(12) = 3.68$, $p = .003$, After Bonferroni corrections were applied ($p < .006$), pair three was no longer significant.

Significant differences were found (see Table 10) for the control group for pair one, where post WR Talk 1 was higher than baseline, $t(13) = -4.52$, $p = .001$, pair three, where WR Talk 2 was higher than post manipulation, $t(13) = -2.26$, $p = .041$, pair four, where WR Talk 2 was higher than baseline, $t(13) = -3.04$, $p = .010$, pair two, where WR Talk 2 was higher than post manipulation, $t(13) = 3.47$, $p = .004$. After Bonferroni corrections were applied ($p < .006$), pairs three and four were no longer significant.

State anxiety. There was no main effect of condition on state anxiety, $F(1, 25) = 1.96$, $p = .173$, $\varepsilon = .271$. There was a main effect of time on state anxiety, $F(2, 52) = 6.35$, $p = .004$, $\varepsilon = .854$. There was no significant interaction of time and condition on state anxiety, $F(2, 50) = 2.47$, $p = .098$, $\varepsilon = .461$.

Inspection of the figure suggests (see Figure 9) that participants increased in state anxiety from baseline to WR Talk 1, and then decreased back to similar baseline levels of state anxiety at WR Talk 2. Paired sample *t*-tests of the main effect of time on state anxiety revealed significant

increases (see Table 11) between baseline and WR Talk 1, $t(26) = -2.90$, $p = .008$, and significant decreases between WR Talk 1 and WR Talk 2, $t(26) = 3.06$, $p = .005$. There were no significant differences between baseline and WR Talk 2, $t(26) = -.142$, $p = .888$.

Laboratory protocol manipulation check. Finally, independent sample *t*-tests were conducted on the manipulation check (see appendix A-4) completed by each participant at the end of the visit. When asked, "How relaxing did you find the activities in today's lab visit?" those in the experimental group rated their visit as significantly more relaxing than the control group, $t(25) = 2.45$, $p = .021$. There were no significant differences found between groups when asked, "How emotionally positive did you find the activities of this lab visit?" $t(25) = 1.07$, $p = .294$, and "How absorbed (focused) were you in the activities of this lab visit?" $t(25) = .504$, $p = .619$. Participants were also asked, "How much better (or improved) do you feel about your ability to handle the event you worry most about after today's lab visit?" and there was no difference between groups, $t(25) = 0.66$, $p = .948$. Finally, participants were asked, "Has your perception of the event you are worried most about changed since before today's lab visit?" and those in the experimental group rated that their perception had changed significantly more than those in the control group, $t(24) = 2.30$, $p = .030$.

Those in the experimental group were asked three additional questions that were pertinent to their specific rational disputation manipulation. When asked, "Did learning about the connection between beliefs and emotional/behavioral consequences help you understand your own personal situation better?" participants[2] (n = 12, $M = 2.83$, $SD = .84$) most often (7/12, 58%) responded, "A great deal." When asked, "Did creating a new belief and emotional/behavioral consequence to think about seem like it could be effective if you practiced it over time?"

[2] One participant failed to complete the questions pertaining to the experimental group.

participants (n = 12, *M* = 3.0 *SD* = .739) most often (6/12, 50%) participants responded, "A great deal." When asked, "Would you be interested in continuing to use this technique when you begin to worry about this event?" participants (n = 12, *M* = 3.25, *SD* = .71) most often (5/12, 42%) responded, "An extreme amount."

Qualitative analyses for rational disputation content. Coding of the rational disputation exercise was done by a laboratory research assistant who analyzed the experimental participant's in-lab video recordings for basic content. The research assistant first received training on the coding form (see Appendix A-7) and what content in particular she was looking for in the video. Then, she watched a video of a pilot experimental participant receive the rational disputation manipulation. Her ratings of the video were evaluated for reliability by the experimenter against ratings made previously by the experimenter. The research assistant and experimenter achieved a 99% agreement in content ratings.

The research assistant evaluated the 13 experimental videos for content that was divided into two categories, i.e., "must use" and "must not use" statements. The purpose of the coding form and having an independent rater of content was designed to ensure that a close script (see appendix B-1) pertaining to the rational disputation exercise was indeed followed and that all experimental participants received a high level of homogenous content. Analyses indicate that there was 100% usage of the six non-verbal and seven verbal "must use" items across all 13 experimental participants. Furthermore, there were zero instances of the two "must not use" items.

There was also an overall global rating performed adapted from Forsberg et al.'s (2008) ratings for motivational interviewing counseling sessions. This global ratings scale was designed to rate the experimenters level of continuity in treating all participants in a similar warm and

engaging fashion. Moreover, it also helped inform whether or not the experimenter deviated largely from one participant to another in tone or emotionality during the rational disputation exercise. These ratings were made on a 7 point Likert scale where 0 represented the lowest level of achievement and 6 represented the highest level of achievement. The six global ratings of visit content were as follows: Experimenter Knowledge: $M = 5.0$, $SD = 0.58$, Empathy: $M = 4.54$, $SD = 0.78$, Positive Attitude: $M = 4.69$, $SD = 0.75$, Positive Mood: $M = 4.62$, $SD = 0.87$, and Friendliness: $M = 4.54$, $SD = 0.78$. The overall rating of all six globals combined was $M = 4.68$, $SD = 0.62$.

Aim 4: Determine if people will actively continue to practice rational disputation at 7 days follow-up and if it increases self-reported coping with perseveration.

Univariate analyses were conducted on a follow up, 9-item questionnaire completed by those in the experimental group (see Appendix A-6) who were assigned to complete the brief rational disputation exercise once a day for one week, starting the day their lab visit took place. All 13 experimental group participants indicated that they practiced the task at least twice over the last week and 6/13 (46%) reported not missing any days of practice over the week time span. Furthermore, two participants practiced five days, four days, and three days, and one participant engaged in two days of practice. All participants practiced a minimum of twice, and on average ($M = 5.2$, $SD = 1.9$) participants reported practicing five days a week (out of the seven assigned) and missed on averaged ($M = 1.5$, $SD = 1.9$) one and a half days. The majority of participants (10/13, 77%) reported practicing at least half the days of the week, i.e., at least 4 days.

Though the instruction was to utilize the rational disputation exercise once a day, participants were encouraged to use the exercise as much as they would like to. Reportedly, one participant used it a total of 27 times in one week. On average participants used the exercise

roughly nine times (*M* = 8.9 *SD* = 6.3) and roughly half (6/13, 46%) used the exercise more than the minimum assigned amount of once a day for seven days, indicating use between eight and 27 times.

When asked, "Did you find any benefit in dealing with the event that worries you most by practicing?" 7/13 (54%) answered at least "A great deal" (*M* = 2.08, *SD* = 1.26). When asked, "Did you find practicing the new thought enjoyable?" two participants (*M* = 2.08, *SD* = 1.26) said, "Very little" 5 said "A moderate amount" and 6 answered "A great deal" or "An extreme amount." When asked, "Have you found you are experiencing any positive emotional/behavioral consequences this week since practicing?" 6/13, 54% stated "A great deal" and one participant indicated "An extreme amount." Five participants answered "Very little" and one indicated "Not at all." 12 of 13 (92%) of participants indicated that they were at least "moderately" likely (4/13, 31% indicating a "great deal likely" and 2/13, 15% indicating "An extreme amount") to continue using this technique after today for the thing that worries them most as well as other things they are worried about.

Finally, when asked if they had any difficulties practicing the rational disputation exercise, most participants (10/13, 77%) indicated "very little" or "not at all" whereas three participants indicated having a "moderate amount" of difficulty in practicing. No participants indicated "A great deal" or "An extreme amount" of difficulty practicing. When asked what those difficulties were in their own words, six participants listed issues with finding time, or being sure to remember to practice, whereas others referenced themes related to trying to "stay positive about the problem", "staying in the moment", and having difficulty "focusing mind on problem solving."

When asked if, "…you'd like to add any other comments regarding your experiences this week that I would find helpful to this study?" one participant stated that it "helped their mood quite a bit" and another stated, "it was pleasant." One participant commented that as a result of the study, she decided to go forward with quitting her stressful job, while retaining her other, less stressful job. Other participants noted that they did not "…notice a huge outcome and would need to practice for a while" and that they were "…under a lot of stress…" due to non-routine important events occurring (e.g., attendance at a conference) and thus had a harder time practicing than they may have typically under "normal" schedule circumstances.

Discussion

Aim 1. Taken together, the psychosocial assessments utilized in this study, especially related to anxiety and depression indicate that those with high PC may have a greater number of barriers to both psychological and CV health than those with low PC. With regard to aim one and hypotheses one and two, those with higher levels of PC are significantly correlated with higher levels of other traits like depressive and anxious symptomatology, sleep dysfunction, pre-sleep arousal, and low self-efficacy. Moreover, as level of PC decreased, general self-efficacy and high striving behavior for goal achievement increased. This may indicate that high levels of worry and rumination (and anxiety and depression) may be responsible for a reduced amount of self-efficacy. If the directionality goes the other way, it may be low self-efficacy that is to blame for increased levels of PC. High PC individuals may also feel less inclined to take more concrete behavioral actions to strive towards goals if they are stymied by worry and rumination. Interestingly, desire for control and positive reframing were not significantly correlated with PC. Though no initial hypotheses were made in regards to coping style, it was found that as PC level goes up, so too does use of denial as a cognitive coping strategy. This result is not surprising in

that denial, or put another way, refusing to believe a problem really exists, may perpetuate more worry in the long run, especially if active coping (striving for goals) is not characteristic for those with high PC.

High PCs scored within the range of "severe anxiety" on the GAD-7, the highest cut off score designation, surpassing the 15 points (by almost 4 additional points; less than 2 point shy of the theoretical maximum score of 20) for such a designation (Swinson, 2006). The one caveat, of course, is whether or not high PC people find their worry/anxiety bothersome (distressful or interfering significantly with their lives) like those with GAD or other anxiety disorders do. The failure to find symptoms of anxiety (and depression possibly also) distressing is arguably riskier than those who *do* find it distressing for poor health outcomes for a number of reasons. If high PC individuals do not find their PC distressing, or possibly worse yet, find it motivating[3], these individuals are not likely to seek help to change those PC habits, or even cope with (perhaps using relaxation exercises) the side effects of high PC that accumulate overtime, for example, sleep dysfunction (Ellis, 1997; DiGiuseppe et al., 2014). Furthermore, high PC participants scored above the range of what Buysse et al., (1989) indicates as 'poor sleeper' (i.e., cut off is 5, high PC in this study, mean of 7.69) as well as indicated that they experience a great deal of pre-sleep arousal related to their worry. This may indicate that a future direction for a brief rational disputation exercise could be in helping reduce pre-sleep arousal as a function of worrying which may in turn benefit sleep quality.

Additionally, some high PC individuals, though indicating some symptoms of depression on the CESD-R, did not indicate severe or frequent enough symptomatology to fall within the ranges of possible, probable, or "meets" standards for a major depressive episode. This could

[3] When asked in-lab, "What are some of the consequences you feel from worrying about this event a lot?" Multiple participants stated that they found it "motivating" or that it "helped them."

have two (or more) potential meanings. First, this may mean that these individuals are pre-clinical in depression or in other words, if left on the track that they are on, they may soon progress to clinical levels of depression. Second, it may indicate that, as discussed above with symptoms of anxiety, that high PC people do not experience a great deal of distress, a loss of interest in activities, or general dysphoria or sadness related to their symptoms of depression, e.g., loss (increase) in appetite, loss (increase) in sleep, fatigue, etc. Again, this may prove even more risky, as high PC people may not recognize when they are indeed experiencing depression and if it is impacting their functioning. Regardless, it appears as though those with high PC are at a similar risk for long term CV complications to the risk found in those with clinical anxiety and depression (Pieper & Brosschot, 2005; Tully, Cosh, & Baune, 2013).

Aim 2. Regarding aim two, hypotheses three and four, results were analyzed both between groups and within groups to determine the effectiveness of a rational disputation exercise on CV recovery following a worry-recall task. As expected, worrying about events, especially the ones that are most bothersome, increases SBP/DBP and HR quite readily (in an acute fashion) for those with high PC. As the literature suggests, this activation if occurring chronically over time may be risky for long term CV health (Pieper & Brosschot, 2005; Verkuil et al., 2009; Ottaviani et al., 2016).

At the end of the lab visit, the experimental group and the control group were not different from one another in level of SBP, DBP, and HR. However, follow-up testing indicated that there were potentially important differences within specific time period of the experiment, though unfortunately they ultimately were non-significant differences after accounting for the number of analyses conducted. Despite the lack of significant between group findings, the trends of what occurred within each group provided good insight into the how a brief (and novel)

rational disputation affects CV responding. What was found is that the experimental group had a great deal of variance in SBP, DBP, and HR during the manipulation period. Most notably, during the last 4 minutes of the disputation exercise (i.e., when the participant is likely utilizing a good deal of cognitive energy) SBP, DBP, and HR increased, not decreased as initially hypothesized. One potential factor related to this increase was that participants talked to some extent during the last 4 minutes of the rational disputation exercise, which may also account for some of the increase in CV responding. Although the experimental group participants experienced much more CV reactivity during the manipulation period than expected, they decreased about 20 SBP points from the last manipulation epoch period to the end of the WR Think 2 period in a very short window of time. The control group participants actually increased slightly in CV measures following the manipulation period and after the WR Think 2.

Finally, the fact that the experimental group participated in this rational disputation activity now, while relatively young and healthy (results indicated all participants were non-hypertensive in casual BP/HR measurements pre-study) may have provided the pro-active training necessary to be the impetus for an overall reduction in worry/rumination and thus levels of PC in the future. As a result, those high PC individuals with rational disputation training may not respond with the same CV intensity as those whose high PC is untreated (and when the new belief is practiced consistently) in the long run. More research would be needed to substantiate this hypothesis.

These results taken together may indicate that although a brief rational disputation initially activates CV responding, it also seems to help CV recovery, especially when high PC people are given a couple minutes to think about their new belief and how it may positively affect them. Furthermore, it may be the case that overtime and practice, the new belief will

become less novel and therefore less activating for the high PC person. It would be beneficial if during stressful times (i.e., times when CV activity is increased) thinking about one's adaptive, rational belief (as opposed to irrational belief which may only continue to instigate CV responding) may help CV recovery instead. Again, further research would be warranted to determine if rational disputation helps reduce both CV reactivity and recovery in the long run.

Aim 3. Like CV in aim 2, between and within group analyses were conducted to investigate the role of a rational disputation exercise on enhancing affect and reducing state anxiety. Regarding hypotheses five and six, the experimental group did not experience significantly different levels of positive and negative affect compared to the control group immediately following the manipulation period as hypothesized. It can be surmised that the benefits in affect in engaging in the rational disputation exercise compared to sitting quietly were delayed. In fact, following WR Talk 2, the experimental group did experience significantly more positive and less negative affect than those in the control group. Interestingly, neither group responded with a great deal of negative affect to the WR manipulation where they talked about what worried them most. It may have been the case that in an acute way, despite the increased CV activation, the participants felt less negative affect due to the positive effects of sharing their story with an empathetic listener. Weinberger (2014) indicates that there are positive emotional benefits on the part of a client when talking to a warm, genuine, and empathetic person. This may have been the case in this study – that although the participants were talking about something worrisome – they actually benefitted to some extent from divulging the information.

Taking a look at what happened within groups in positive and negative affect, those in the experimental group significantly increased in positive affect and decreased in negative affect following the manipulation period compared to post WR Talk 1. The control group on the other

hand decreased (non-significantly) in positive affect and increased in negative affect WR Talk 1 compared to post manipulation period.

Furthermore, another interesting and unexpected event occurred during the WR Talk 2 period within the control group. Some participants indicated during the lab visit that, "Now that I think about it more…" and followed this statement up with a somewhat reversal of their initial feelings of worry. Some participants actually stated that "after talking it out" they felt better, despite not having any formal intervention like the experimental group had received. Some control participants ended up partly about the worrisome event, but also about what they had done to cope (positively) with it, like meditation, or going on a walk. Despite this anecdote, the control group participants' negative and positive affect continued to get worse over the length of the visit (post WR Talk 1) whereas the experimental group's affect continued to improve over the course of the visit. Taken together, a rational disputation exercise appears to benefit affect and sitting quietly in a chair on the other hand does not. It may be surmised that though *some* control group participants benefitted slightly from talking about their worrisome event, that by and large not engaging in an activity (like the experimental group did) to attempt to cope with the worry-recall task instigated overall worse outcomes in affect.

With regards to hypothesis seven, those in the experimental group did not see significantly greater reductions in state anxiety than the control group over time. It was expected that state anxiety would increase from baseline to post WR Talk 1, and that in fact, did occur. However, groups were not significantly different in state anxiety following WR Talk 2. There are number of reasons this may have bene the case. Firstly, all participants started with a rather elevated level of state anxiety to begin with. The participants in this study who came in for the lab visit entered a baseline level of state anxiety (i.e., about 42) above what was found to be

normative for a non-state anxious sample, (i.e., about 37). After talking about their worrisome event, high PC participants experienced levels of state anxiety not dissimilar to what was found in a sample of pregnant women who had just found out that their unborn baby was diagnosed with Spina Bifida, (i.e., a score of around 47). This level of baseline elevated state anxiety may indicate that high PC individuals may not respond significantly in an acute way due to their already elevated levels of state anxiety to begin with. In fact, it only strengthens the notion that there is a great deal of need for effective interventions for those with high PC. Furthermore, high PC individuals may simply necessitate a more intensive, longer duration intervention to experience greater reductions in state affect. Another explanation may be that reductions in state anxiety were not captured in the brief length of the lab visit. It may have been that once the participant left and carried on with their day that state anxiety would be reduced hours later. It should be noted that generally speaking, the experimental group participants actually did improve levels of state anxiety at the end of the study than what they had when they arrived to the lab. Further research will be needed to investigate the benefits of rational disputation on reducing state anxiety to better understand what is occurring on an acute level.

Aim 4. Experimental group participants were asked to practice their rational disputation exercise on their own for one week. Aim 4 and hypotheses eight and nine addressed whether or not participants would voluntarily utilize this practice and benefit from it. Not only did every single one of the 13 participants report engagement in the exercise, but many participants used it more than once a day. Generally speaking, participants found the exercise beneficial and were interesting in using it after their participation in this study. Many participants enjoyed the experience so much that they felt happier and calmer following their week of practice. Admittedly, some participants mentioned that they struggled with remembering to engage in the

practice, finding time to do it, or remembering exactly how to do it. This is not a surprising finding because it can be difficult to change habits so deeply engrained; a finding that echoes what Ellis said when speaking about the rigidity and inflexibility of IBs.

Even though this part of the study was most fluid in nature, the findings are important as they indicate that though people may need some additional training to get the hang of it, they find rational disputation useful and interesting. Some participants reported that they think they would need more than one week to benefit from the exercise and that is a very reasonable statement. Seeing as how research related to the compliance with and enjoyment of homework activities in CBT is quite limited (Ellis, 1997) this study provides evidence that people are interested in, enjoy, and will utilize homework if asked. Further research would be beneficial in this regard.

General Discussion

This study was able to add to the scant literature related to REBT theory/practice and its effects on CV responding. This study was able to show support that worrying instigates increases in CV responding as well as increases in state anxiety, negative affect, and decreases in positive affect in an acute way for those with high PC following worry. Perhaps the most powerful finding of this study was that despite the unexpected amplitude of the experimental group's CV responding during the rational disputation exercise, they continued to experience positive changes in affect. In opposition to that, the control group, despite a relatively stable level of CV continued to experience negative changes in affect.

This study showed support for the idea that a rational disputation exercise can be packaged and presented in a relatively brief and efficient way. Most importantly, this study indicates that rational disputation may be helpful for those with high PC recover from the

negative effects of worry (e.g., CV activation, increased state anxiety, and negative affect) in the long run. Even though the brief rational disputation exercise seemingly instigated CV activation, it may be the case that overtime as the novelty of the process goes away, this activation would no longer occur; that with repeated practice, the 'new rational belief' becomes simply 'a belief.' Furthermore, this study found support that people self-report their enjoyment in engaging in the activity, that they find benefit from it, and that they would, indeed, like to continue using it. To summarize, it seems as though if a person with high PC can have their health negatively impacted by worry, they can conversely have it positively impacted with the use of rational disputation.

The implications of this study may be significant in the public health sector. Being that those with high PC are not necessarily likely to realize they are at risk for long term CV and psychological issues, they may never seek help until they are indeed already suffering from an illness. A brief rational disputation exercise may be a proactive means of educating the public on maladaptive cognitive states and traits and via a brief training, introduce a new skill in combating those issues. Finally, at the very least, this study provides the impetus behind the need for additional research to be done in this area.

Limitations

This study had limitations regarding the overall scope of the laboratory experiment. Due to the non-funded nature of this project, recruitment of participants was a challenge. Though a few of the analyses for the lab portion of the visit found a high level of statistical power, many found a low statistical power. Therefore, a larger sample size would be more ideal to make the study as externally valid as possible.

On the point of external validity, there are limits that this study has on its findings due to the in-lab experience being different relative to more "real world" experiences of worry. Though the lab experience provided a high level of internal validity, it is still unknown for this particular experiment how one's CV, affective, and anxiety responses would be different (if at all) in their personal environments, both as a function of worrying and recovering from worry. Furthermore, due to the novel nature of this project, the outcome variables could only be measured in a very acute way, i.e., pre, during, and immediately following an approximate one hour lab visit. It was an advantage to this study to include a 7-day follow-up period of rational disputation practice, however it was carried out in a rather free-flowing way, where participants, on their honor, were asked to practice and report back the extent to which they had utilized the technique.

Another limitation to this study, but also REBT theory/practice in general, is the disagreement between what actually constitutes a true IB. The content of participants' stories was not analyzed for the purposes of this study and thus one cannot say how "true" a rational disputation took place. In other words, was the participants' attempt at a brief rational disputation exercise (via use of rational alternative technique and Socratic questioning style) truly a good representation of a disputed IB? Additionally, many REBT therapists, and/or CBT therapists in general would surmise that cognitive change may take a few sessions of work for the client to truly understand and engage in the rational disputation. This study, however, was truly not meant to be a faster version of a complete REBT experience, but rather, a brief introduction and education of the relationship between IBs and emotional/behavioral consequences as well as a brief practice with rational disputation.

Finally, the chosen protocol for the control group had some limitations in its ability to be a good comparison against the protocol of the experimental group. One thing that was not

considered is the fact that the experimental group participants would be talking to some extent during the manipulation period and thus, making the control group (who did not talk at all) not a fair comparison. Admittedly, it was, however, a surprise that the experimental group would show the level of CV engagement and responding that they did.

Future Directions

The logical next step for this project would be to investigate the use of the rational disputation exercise in a longitudinal fashion. For example, one might recruit high PC individuals for a year-long study where participants would be randomly assigned to groups, i.e., a rational disputation group, and a wait list control group. This type of study would allow analyses looking at more long term assessments of anxiety, depression and may hopefully find evidence that after long term use, one's level of PC may decrease as the adaptation of more rational beliefs leads to less worry and rumination. In order to determine efficacy in CV responding, one might investigate acute CV responses in a sample of hypertensive patients, to see if the CV responding pattern is affected in those patients in the same fashion as non-cardiac patients in both an acute and longitudinal fashion. This population may potentially benefit greatly from a brief rational disputation exercise as it may provide the framework for increasing coping skills related to chronic worry/rumination and stress management, and therefore, this population may ultimately in turn reap the benefits cognitive restructuring has on affect and CV functioning. If this type of brief intervention was introduced as a more routine evaluation in medical settings, being they cardiovascular or primary care, a greater number of individuals would be reached for a number of reasons. A number of people, due to limited financial and/or community resources may never have the opportunity to meet with a mental health care professional or with any kind of medical professional.

Furthermore, as mental health becomes a more and more integrated part of general health care, the system will begin needing a basis with which to evaluate people for risky personality traits who may not otherwise meet criteria for clinical psychiatric diagnoses, and similarly may not necessitate a large amount psychotherapy. Instead, a brief rational disputation exercise may help instigate positive cognitive skills that may in turn proactively (instead of reactively) promote health and wellness.

	Logical	Empirical	Functional	Rational Alternative
Socratic	SL	SE	SF	SRA
Metaphor	ML	ME	MF	MRA
Humor	HL	HE	HF	HRA
Didactic	DL	DE	DF	DRA

Figure 1. Disputation matrix. Columns represent strategy and rows represent style.

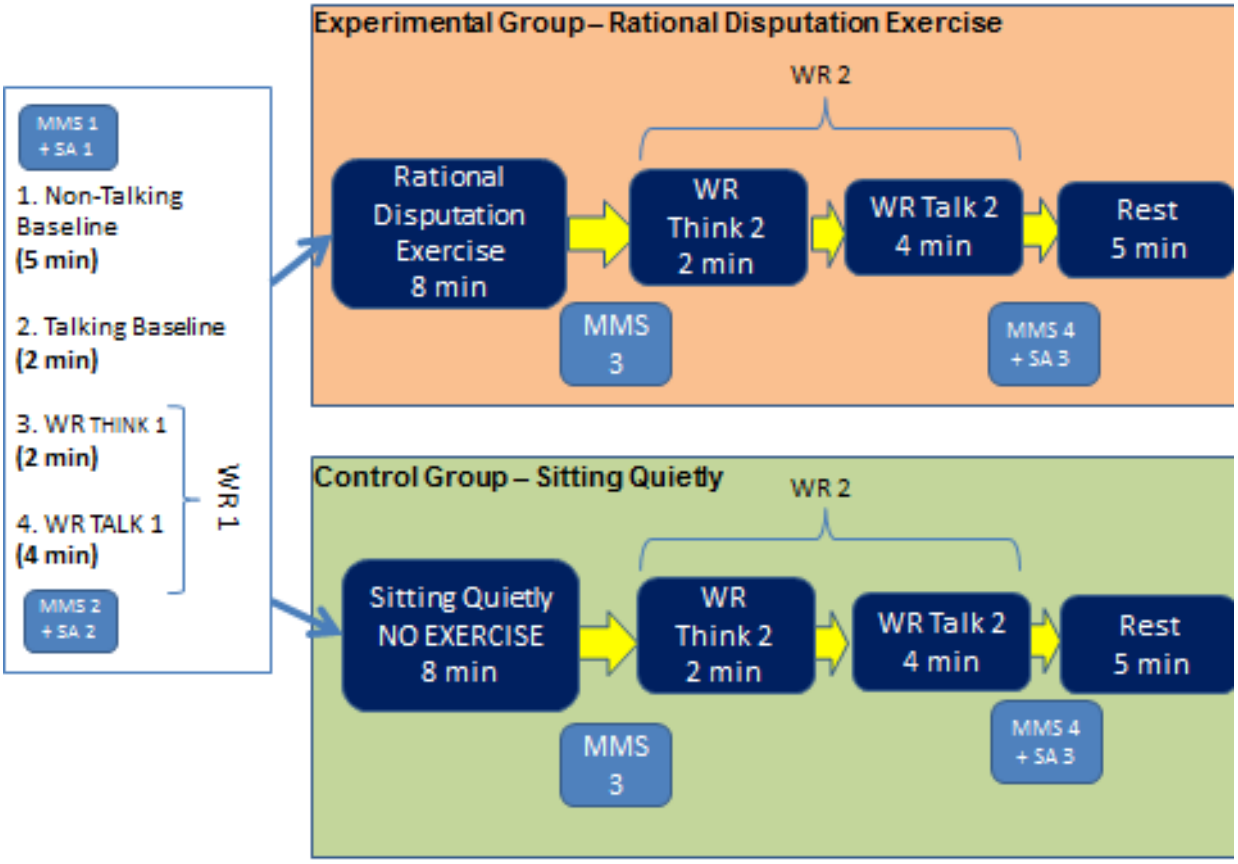

Figure 2. Laboratory protocol schematic.

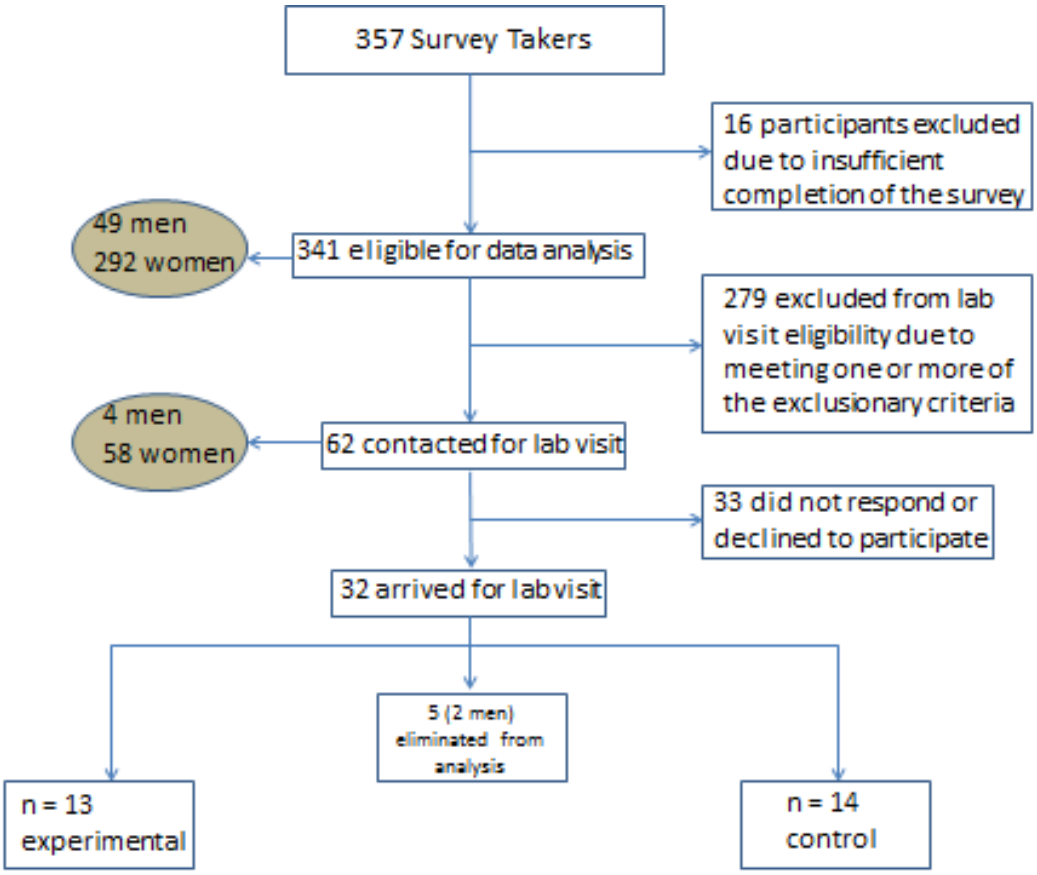

Figure 3. Participant flow.

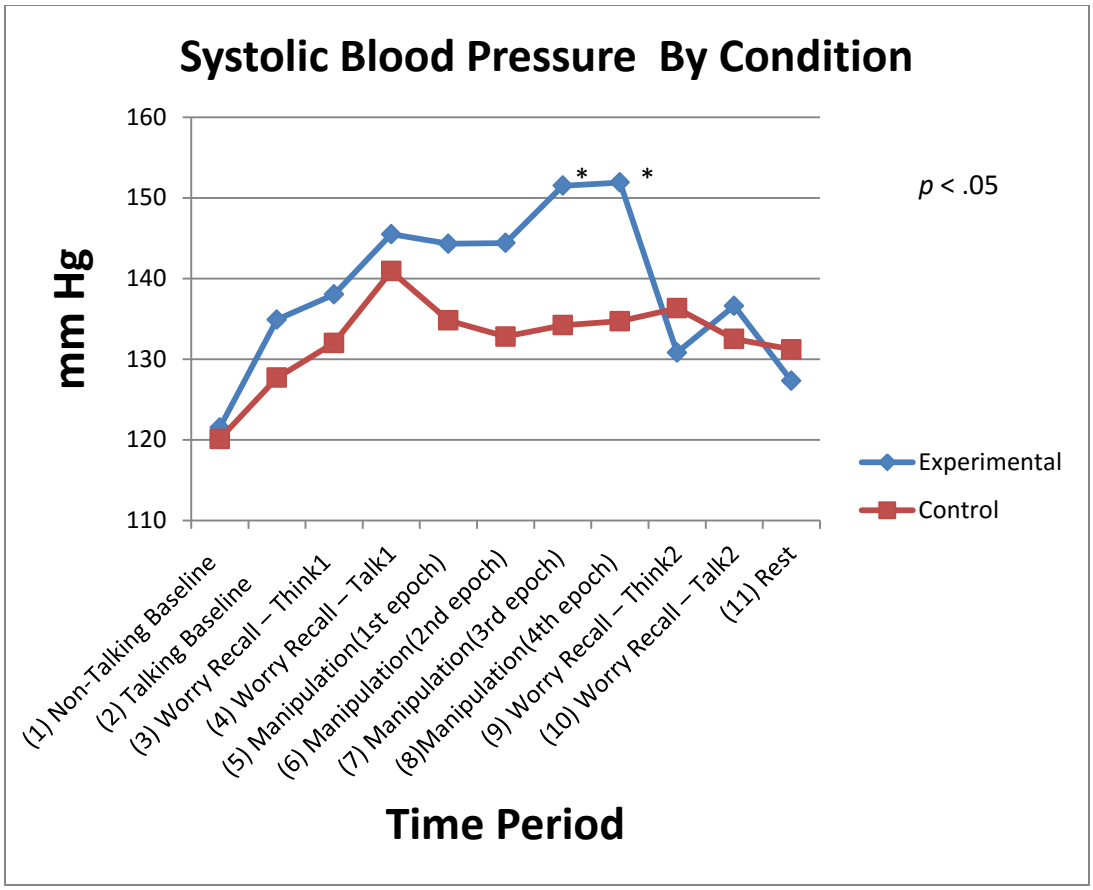

Figure 4. SBP by condition over time. Asterisks indicate group differences at time points significant at $p < .05$ prior to Bonferroni corrections. Post Bonferroni corrections ($p < .005$) simple effects are no longer significant.

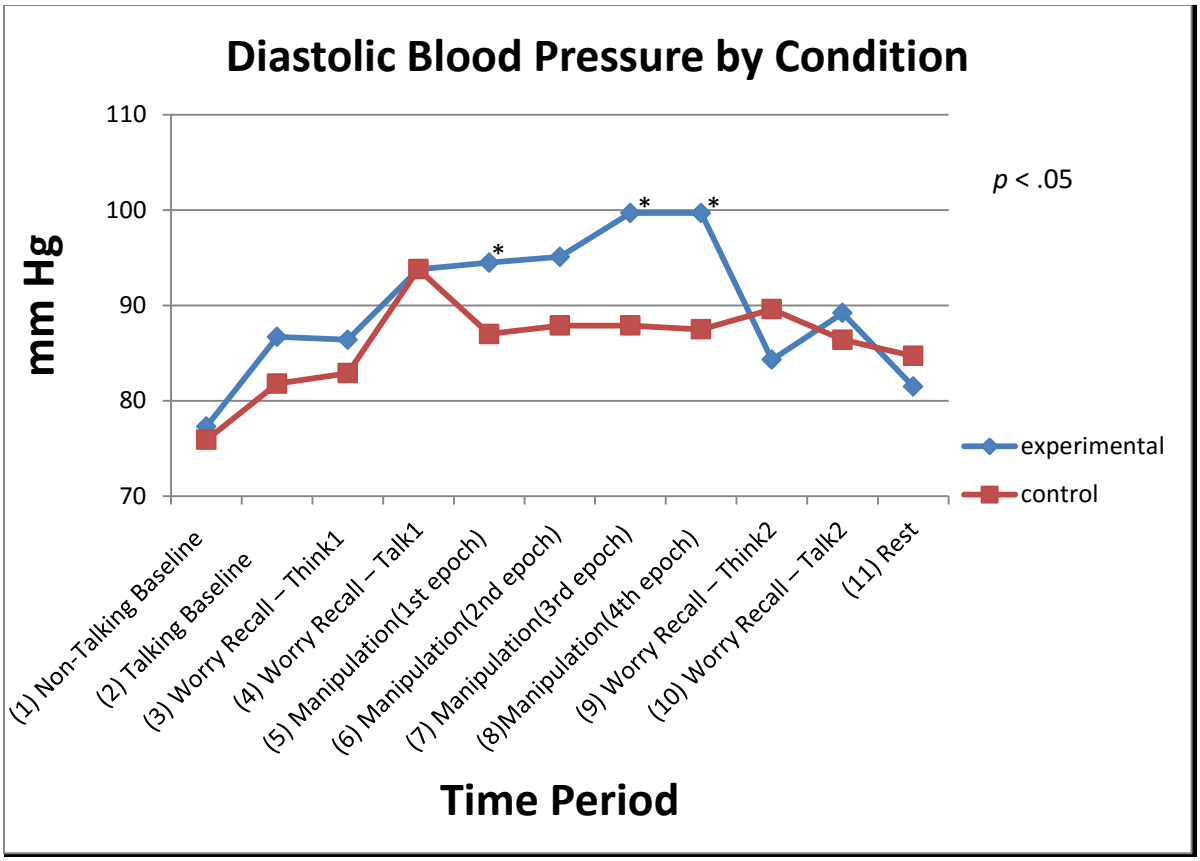

Figure 5. DBP by condition over time. Asterisks indicate group differences at time points significant at $p < .05$ prior to Bonferroni corrections. Post Bonferroni corrections ($p < .005$) simple effects are no longer significant.

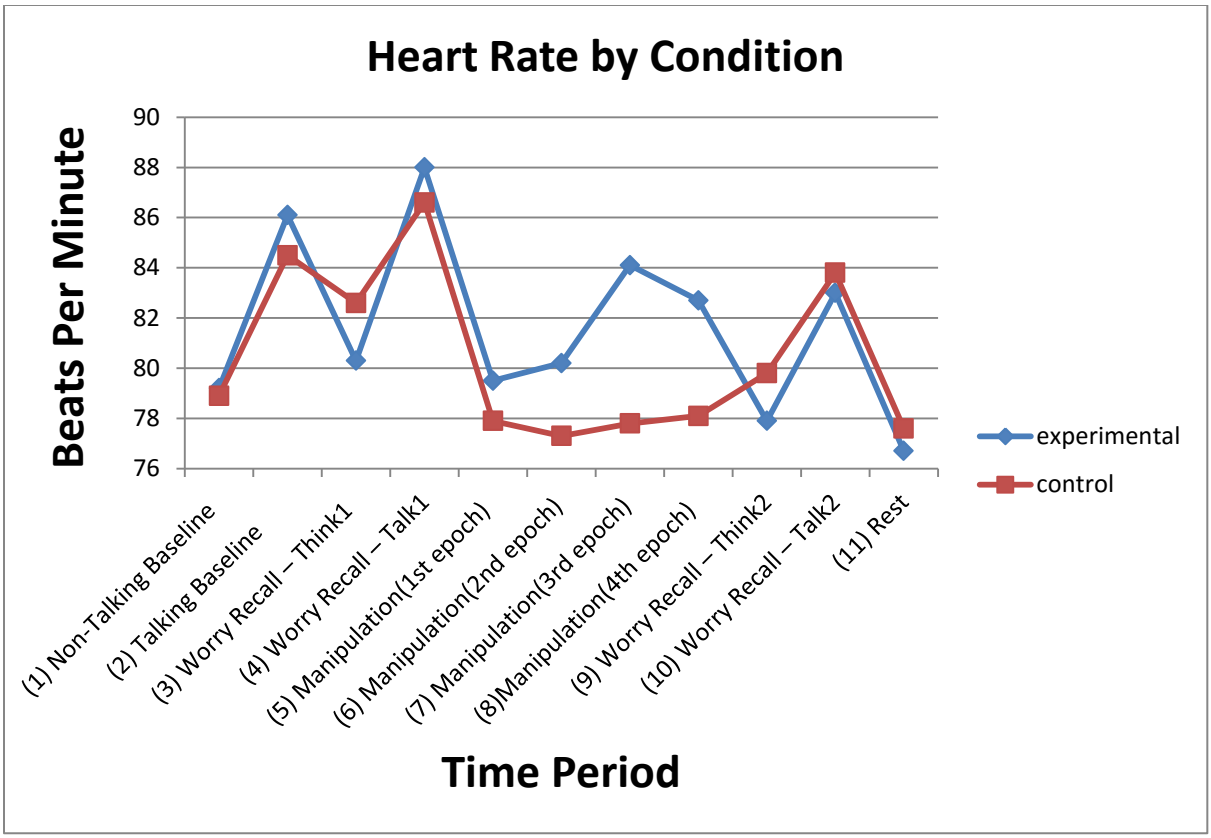

Figure 6. HR by condition over time.

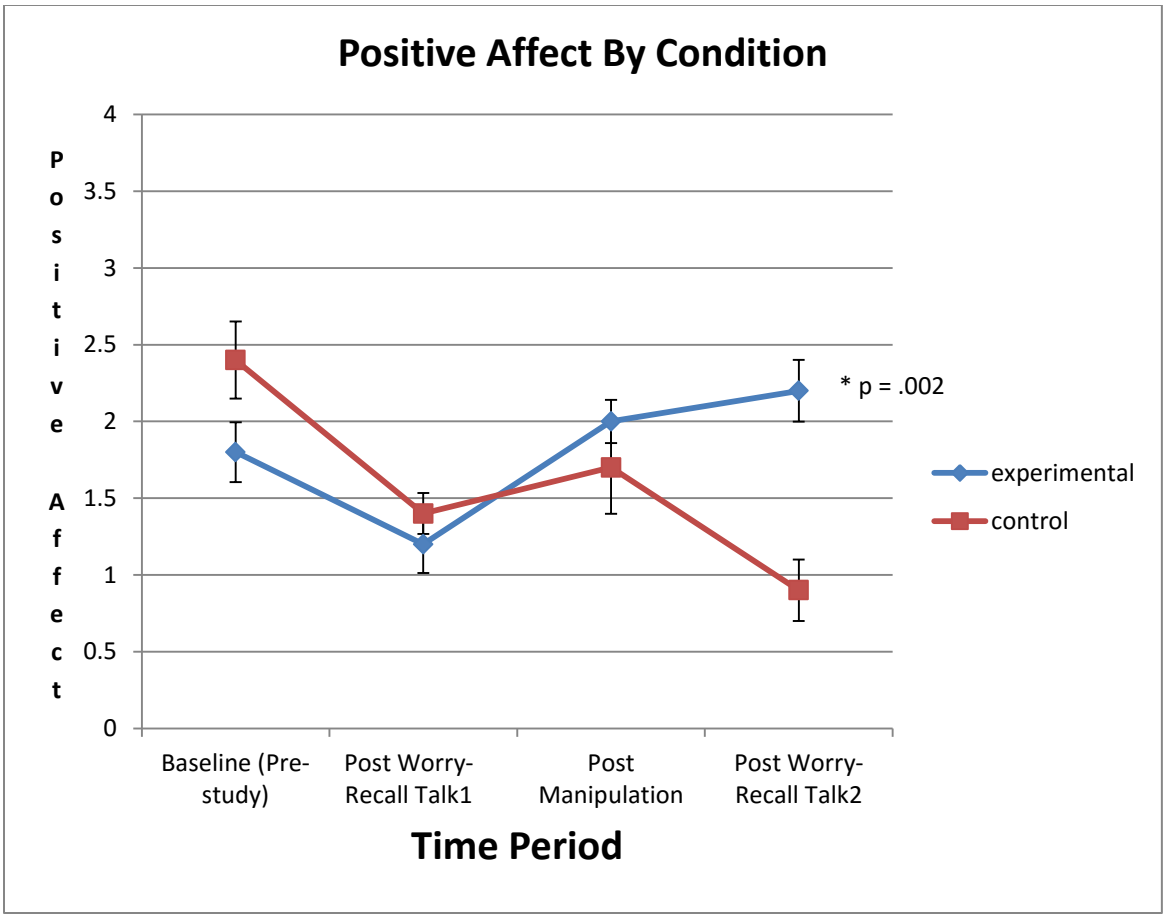

Figure 7. Positive affect over time by condition. Asterisk indicates group differences at specific time point. Significance remains following Bonferroni corrections ($p < 0.013$).

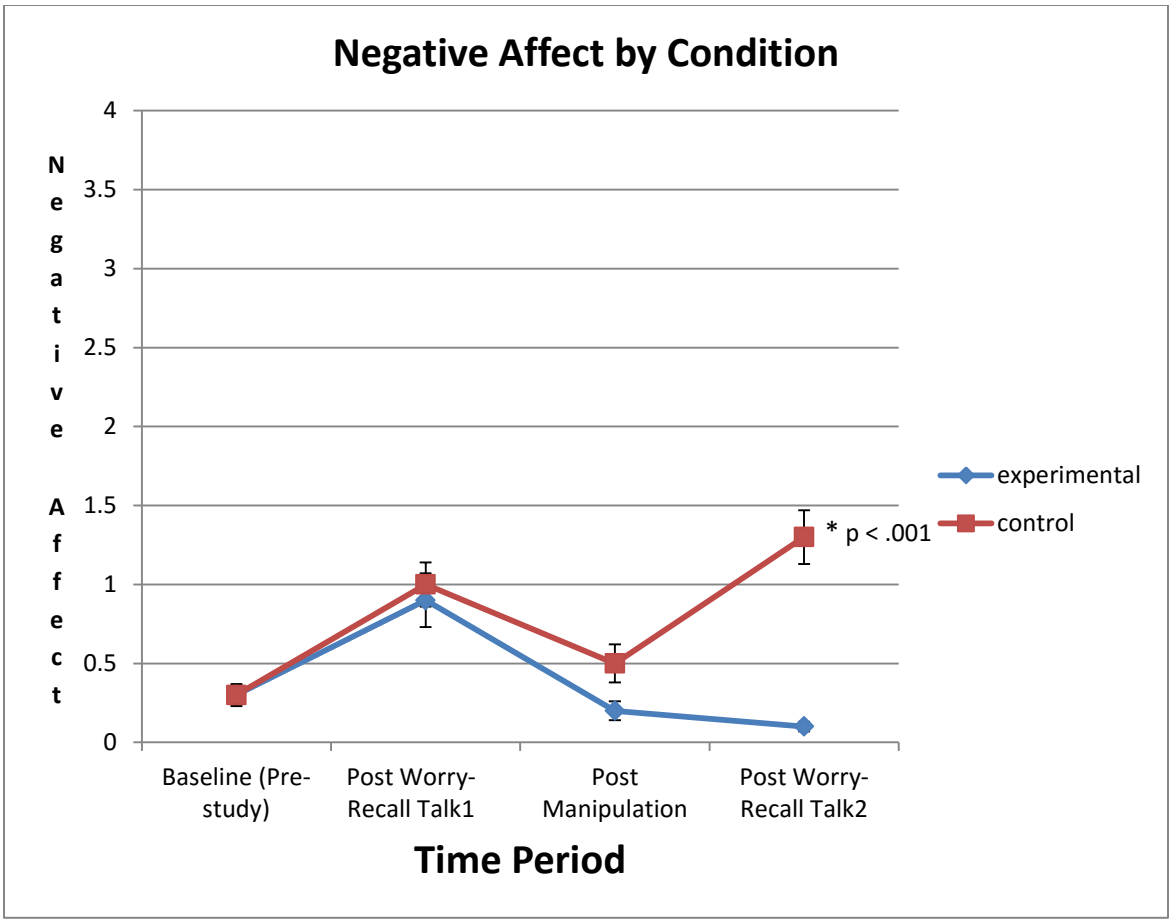

Figure 8. Negative affect over time by condition. Asterisk indicates group differences at specific time point. Significance remains following Bonferroni corrections ($p < 0.013$).

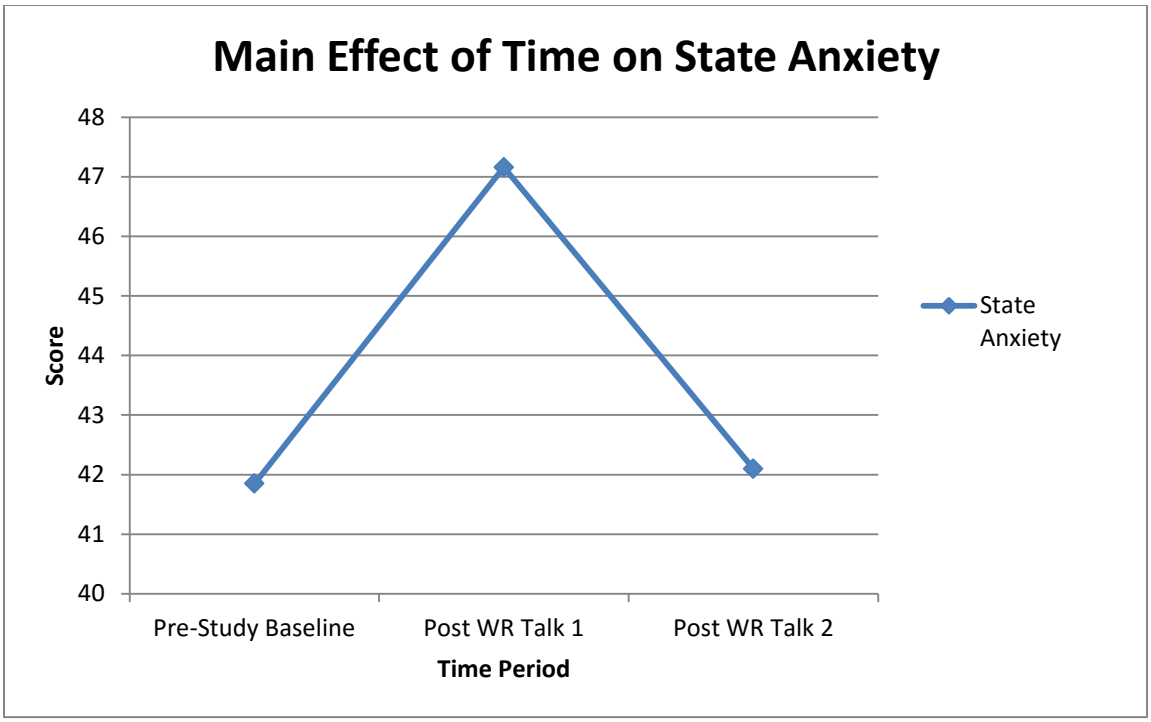

Figure 9. Main effect of time on state anxiety. Significant increases between baseline and WR Talk 1, $p = .008$. Significant decreases between WR Talk 1 and WR Talk 2, $p = .005$. No significant differences between baseline and WR Talk 2, $p = .888$. *Note.* Higher scores indicate more state anxiety.

Table 1

Bivariate Correlations among the psychological variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) RRS	1	.64**	.91**	.74**	-.35**	-.31**	-.05	.66**	.69**	.45**	.65**	.53**	.16*	.35**
(2) PSWQ		1	.91**	.56**	-.27**	-.35**	-.10	.66**	.73**	.37**	.60**	.40**	.03	.12
(3) PC Z-Score			1	.72**	-.35**	-.36**	-.08	.73**	.78**	.45**	.69**	.52**	.11	.26**
(4) CESD-R				1	-.28**	-.21**	-.40	.61**	.72**	.58**	.67**	.56**	.06	.22**
(5) JHAC					1	.55**	.38**	-.31**	-.23**	-.21**	-.16**	-.17**	.05	-.15**
(6) GSE						1	.35**	-.38**	-.29**	-.13*	-.13*	-.16**	.16**	-.07
(7) DOCS							1	-.14**	-.01	.04	.01	-.06	.09	-.08
(8) PSS								1	.74**	.35**	.59**	.45**	-.02	.19**
(9) GAD-7									1	.50**	.67**	.55**	.08	.24**
(10) PSQI										1	.49**	.42**	.05	.16**
(11) PSAS-Cog.											1	.73**	.12	.25**
(12) PSAS-Som.												1	.07	.32**
(13) COPE-Pos. Reframe.													1	.11
(14) COPE-Denial														1

Note. ** $p < .001$, * $p < .01$. (1) RRS = Ruminative Response Scale, (2) PSWQ = Penn State Worry Questionnaire, (3) PC Total Z-Score (4) CESD-R = Center for Epidemiological Studies Depression Scale – Revised (5) JHAC = John Henryism Active Coping (6) GSE = Generalized Self-Efficacy Scale (7) DOCS = Desirability of Control Scale (8) PSS = Perceived Stress Scale (9) GAD-7 = Generalized Anxiety Disorder-7 (10) PSQI = Pittsburgh Sleep Quality Index (11) PSAS Cog.= Pre-Sleep Arousal Scale: Cognitive Subscale (12) PSAS Som. = Pre-Sleep Arousal Scale: Somatic Subscale (13) COPE-Pos. Reframe. = Brief COPE: Positive Reframing Subscale (14) COPE-Denial = Brief COPE: Denial Subscale

Table 2

Survey: Participants Characteristics by PC type

	Group		
	High PC (n = 145)	Low PC (n = 84)	
Variable			*p*
Age M(*SD*)	20.97(*3.17*)	21.64(*3.73*)	0.150
Gender (n)			0.082
Men	13	14	
Women	132	70	
Race (n)			0.875
Caucasian/White	100	60	
Afro-American/Black	10	4	
Hispanic	9	7	
Asian	15	9	
College Class (n)			0.246
Freshman	35	22	
Sophomore	45	14	
Junior	31	21	
Senior	30	24	

Note. Chi-square tests of significant differences conducted on gender, race, and college class, and independent sample *t*-test for age for all survey participant characteristics.

Table 3

Means and Standard Deviations of Participant Demographic Characteristics

		Group		
	Survey Sample	Experimental	Control	
Variable	(n = 292)	(n = 13)	(n = 14)	*p*
Age M(*SD*)	21.0(*3.14*)	20.4(*1.19*)	19.78(*1.37*)	0.996
Race (n)				0.209
Caucasian/White	182	9	9	
Afro-American/Black	15	2	1	
Hispanic	20	1	0	
Asian	28	0	3	
College Class (n)				0.450
Freshman	66	3	5	
Sophomore	64	2	5	
Junior	55	1	3	
Senior	68	7	1	

Note. Chi-square tests of significant differences for race, and college class and independent sample *t*-tests for age. Only data on women in the survey sample are reported here for comparison because men were not used in the laboratory portion of this study.

Table 4

Hierarchical multiple regression for relevant psychosocial factors in perseverative cognition when accounting for sociodemographic factors

		R-square	R-square change	Sig. F Change	Partial r	Std. beta	p
Step 1: (df = 4, 334)	Age	.019	.019	.178	-.037	-.045	.498
	Gender				-.103	-1.04	.059
	Ethnicity				.000	.000	.999
	College Classification				-.036	-.043	.514
Step 2: (df = 2, 332)	GAD-7	.678	.659	.000	.556	.551	.000
	CESD-R				.367	.325	.000
Step 3: (df = 9, 323)	JHAC	.745	.067	.000	-.112	-.073	.044
	GSES				-.139	-.093	.012
	PSS				.235	.200	.000
	DOCS				.037	.021	.508
	PSQI				.004	.003	.943
	PSAS Cognitive				.253	.234	.000
	PSAS Somatic				-.087	-.068	.118
	COPE Denial				.073	.040	.186
	COPE Pos. Reframe				.141	.076	.011

Table 5
Means and Standard Deviations of Systolic BP, Diastolic BP, and HR: Time Period X Group.

	Group						
	Experimental (n = 13) M *(SD)*			Control (n = 14) M *(SD)*			
Time Period	*SBP*	*DBP*	*HR*	*SBP*	*DBP*	*HR*	*p*
(1) Non-Talking Baseline *5 minutes*	121.5(16.2)	77.3(10.5)	79.2(11.9)	120.1(14.3)	75.9(8.8)	78.9(14.7)	
(2) Talking Baseline *2 minutes*	134.9(12.9)	86.7(9.6)	86.1(12.0)	127.7(12.2)	81.8(11.1)	84.5(13.3)	
(3) Worry Recall – Think1 *2 minutes*	138.0(16.4)	86.4(10.4)	80.3(12.0)	132.0(18.9)	82.9(10.6)	82.6(13.8)	
(4) Worry Recall – Talk1 *4 minutes*	145.5(20.5)	93.8(12.4)	88.0(8.4)	140.9(18.3)	93.8(12.4)	86.6(13.0)	
(5) Manipulation(1st epoch) *2 minutes*	144.3(16.3)	94.5(10.2)*	79.5(11.0)	134.8(11.5)	87.0(6.8)	77.9(12.6)	DBP, $p = .034$
(6) Manipulation(2nd epoch) *2 minutes*	144.4(22.7)	95.1(14.0)	80.2(11.1)	132.8(11.2)	87.9(8.7)	77.3(13.1)	
(7) Manipulation(3rd epoch) *2 minutes*	151.5(21.0)*	99.7(15.3)*	84.1(11.0)	134.2(13.0)	87.9(9.1)	77.8(13.5)	SBP, $p = .016$ DBP, $p = .021$
(8)Manipulation(4th epoch) *2 minutes (8 min. total)*	151.9(21.7)*	99.7(15.8)*	82.7(10.8)	134.7(13.8)	87.4(9.8)	78.1(13.5)	SBP, $p = .020$ DBP, $p = .021$
(9) Worry Recall – Think2 *2 minutes*	130.8(13.5)	84.3(10.3)	77.9(11.2)	136.3(11.9)	89.6(10.7)	79.8(13.5)	
(10) Worry Recall – Talk2 *4 minutes*	136.6(19.7)	89.2(13.1)	83.0(9.3)	132.5(14.6)	86.4(9.6)	83.3(11.0)	
(11) Rest *5 minutes*	127.3(22.7)	81.5(12.7)	76.7(11.5)	131.2(12.8)	84.7(10.5)	77.6 (11.1)	

Note: *p*-values listed here are those comparisons that achieve significance at the uncorrected level.* $p < .05$, asterisk is paired with the higher value at the uncorrected level of significance of group at time period. After the Bonferroni correction ($p < .005$) was made, no significant differences were achieved.

Table 6

Means and Standard Deviations of Repeated Measures Comparisons of CV for Experimental Group

	Measure			
	SBP	DBP	HR	*p*
Paired Comparison				
(1) Baseline – WR Talk 1				
	121.5(16.2) – 145.5(20.5)***	77.3(10.5) – 93.8(12.4)***	79.2(11.9) – 88.0(8.4)***	SBP $p < .001$ DBP $p < .001$ HR $p = .001$
(2) WR Talk 1 – Post Manip.				
	145.5(20.5) – 151.9(21.7)	93.8(12.4) – 99.7(15.8)	88.0(8.4) – 82.7(10.8)	
(3) Post Manip. – WR Think 2				
	151.9(21.7)*** – 130.8(13.5)	99.7(15.8) – 84.3(10.3)***	82.7(10.8)*** – 77.9(11.2)	SBP $p < .001$ DBP $p = .001$ HR $p = .001$
(4) WR Think 2 – Rest				
	130.8(13.5) – 127.3(22.7)	84.3(10.3) – 81.5(12.7)	77.9(11.2) – 76.7(11.5)	

Note. ** $p < .01$, *** $p \leq .001$ Asterisk located next to higher value. Bonferroni correction, $p < .006$. Only *p*-values listed here are those comparisons that achieve significance.

Table 7

Means and Standard Deviations of Repeated Measures Comparisons of CV for Control Group

	Measure			
	SBP	DBP	HR	*p*
Paired Comparison				
(1) Baseline – WR Talk 1				
	120.1(14.3) – 140.9(18.3)***	75.9(8.8) – 91.7(10.5)***	78.9(14.7) – 86.6(13.0)***	SBP $p < .001$ DBP $p < .001$ HR $p = .001$
(2) WR Talk 1 – Post Manip.				
	140.9(18.3) – 134.7(13.8)	91.7(10.5) – 87.4(9.8)	86.6(13.0) – 78.1(13.5)	HR $p < .001$
(3) Post Manip. – WR Think 2				
	134.7(13.8) – 136.3(11.9)	87.4(9.8) – 89.5(10.7)	78.1(13.5) – 79.8(13.5)	
(4) WR Think 2 – Rest				
	136.3(11.9) – 131.2(12.8)	89.5(10.7) – 84.4(10.5)	79.8(13.5) – 77.6(11.1)	

Note. *** $p \leq .001$ Asterisk located next to higher value. Bonferroni correction, $p < .006$. Only *p*-values listed here are those comparisons that achieve significance.

Table 8

Means and Standard Deviations of Affect Ratings: Time Period X Group

	Group				
	Experimental (n = 13) M *(SD)*		Control (n = 14) M *(SD)*		
Time Period	*Positive*	*Negative*	*Positive*	*Negative*	*p, Cohen's d*
(1) Baseline (Pre-study)	1.8(0.7)	0.3(0.2)	2.4(0.9)	0.3(0.3)	
(2) Post Worry-Recall Talk1	1.2(0.7)	0.9(0.6)	1.4(0.5)	1.0(0.5)	
(3) Post Manipulation	2.0(0.5)	0.2(0.2)	1.7(1.1)	0.5(0.5)	
(4) Post Worry-Recall Talk2	2.2(0.7)**	0.1(0.1)	0.9(0.7)	1.3(0.8)**	PA, $p = .002$, $d = 1.86$ NA, $p < .001$ $d = 2.07$

Note. ** $p < .01$ asterisk is paired with the higher value and indicates significant difference of group at specific time period. Bonferroni correction, $p < .013$. Only *p*-values listed here are those comparisons that achieve significance. PA = positive affect, NA = negative affect.

Table 9

Means and Standard Deviations of Positive and Negative Affect: Repeated Measures Comparisons for Experimental Group

Paired Comparison: n = 13	Positive	Negative	*p*
(1) Baseline (Pre-study) – WR Talk 1	1.8(0.7) – 1.2(0.7)	0.3(0.2) – 0.9(0.6)**	NA, $p = .003$
(2) WR Talk 1 – Post Manip.	1.2(0.7) – 2.0(0.5)***	0.9(0.6)*** – 0.2(0.2)	PA, $p = .001$
			NA, $p < .001$
(3) Post Manip. – WR Talk 2	2.0(0.5) – 2.2(0.7)	0.2(0.2) – 0.1(0.1)	
(4) Baseline (Pre-study) – WR Talk2	1.8(0.7) – 2.2(0.7)	0.3(0.2)** – 0.1(0.1)	NA, $p = .003$

Note. *** $p \leq .001$, ** $p < .01$. Asterisk is paired with the higher value. Bonferroni correction, $p < .006$. Only *p*-values listed here are those comparisons that achieve significance. PA = positive affect, NA = negative affect.

Table 10

Means and Standard Deviations of Positive and Negative Affect: Repeated Measures Comparisons for Control Group

Paired Comparison: n = 14	Positive	Negative	*p*
(1) Baseline (Pre-study) – WR Talk 1	2.4(0.9)*** – 1.4(0.5)	0.3(0.3) – 1.0(0.5)***	PA, $p = .001$ NA, $p = .001$
(2) WR Talk 1 – Post Manip.	1.4(0.5) – 1.7(1.1)	1.0(0.5)** – 0.5(0.5)	NA, $p = .004$
(3) Post Manip. – WR Talk 2	1.7(1.1) – 1.3(0.8)	0.5(0.5) – 0.9(0.6)	
(4) Baseline (Pre-study) – WRTalk2	2.4(0.9)*** – 1.3(0.8)	0.3(0.3) – 0.9(0.6)	PA, $p < .001$

Note. *** $p \leq .001$, ** $p < .01$. Asterisk is paired with the higher value. Bonferroni correction, $p < .006$. Only *p*-values listed here are those comparisons that achieve significance. PA = positive affect, NA = negative affect.

Table 11

Means and Standard Deviations of State Anxiety: Time Period X Group

	Group	
	Experimental (n = 13)	Control (n = 14)
Time Period	M *(SD)*	M *(SD)*
(1) Baseline (Pre-study)	41.3(6.6)	42.4(8.1)
(2) Post Worry-Recall Talk1	46.2(9.5)	48.1(9.3)
(3) Post Worry-Recall Talk2	37.9(5.7)	42.1(9.3)

Note: No significant between group differences.

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Appendix A-1

Laboratory – Recording Forms

OMRON BP

Experimenter Recording Form

Resting Blood Pressure and Heart Rate Measures

	(1)	(2)	(3)
SBP	_____	_____	_____
DBP	_____	_____	_____
HR	_____	_____	_____

Notes:

Appendix A-2

Laboratory – Assessments

Momentary Mood Scale (MMS)

Please rate the way you're feeling right now.

	Not at all		A Moderate Amount		Very much
Depressed	0	1	2	3	4
Content	0	1	2	3	4
Happy	0	1	2	3	4
Tense	0	1	2	3	4
Annoyed	0	1	2	3	4
Angry	0	1	2	3	4
Frustrated	0	1	2	3	4
Sad	0	1	2	3	4
Powerless	0	1	2	3	4
Hopeless	0	1	2	3	4
Ashamed	0	1	2	3	4
Strengthened	0	1	2	3	4
Disgusted	0	1	2	3	4
Surprised	0	1	2	3	4
Neutral (no emotion)	0	1	2	3	4

Appendix A-3

Laboratory - Assessments

State Anxiety Inventory – 6 (STAI 6)

Please read the statement and circle the most appropriate number to the right of the statement to indicate how you feel right now. Do not spend too much time on one statement but give the answer which seems to describe your present feeling best.

1. I feel calm
2. I feel tense
3. I feel upset
4. I feel relaxed
5. I feel content
6. I am worried

Scale
1 = Not at all
2 = Somewhat
3 = Moderately
4 = Very Much

Appendix A-4

Laboratory – Assessments

Manipulation Check – Experimental or Control

1. In general, how difficult were the activities in this lab visit to understand?
[0] Not at all [1] Very little difficulty [2] moderately difficult
[3] greatly difficult [4] extremely difficult

2. In general, how much effort did you put into performing the activities of this lab visit exactly as asked by the experimenter?
[0] None at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

3. How relaxing did you find the last two (thinking about event and talking about event for the second time) activities of this lab visit?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

4. How emotionally positive did you find the result of this lab visit to be for you?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

5. How absorbed (focused) were you in the last two (thinking about event and talking about event for the second time) activities of this lab visit?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

6. How much better (or improved) do you feel about your ability to handle the event you worry most about after today's lab visit?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

7. Has your perception of the event you are worried most about changed since before today's lab visit?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

(For experimental group only)
8. Did learning about the connection between beliefs and emotional/behavioral consequences, help you understand your own personal situation better?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

9. Did creating a new belief and emotional/behavioral consequence to think about seem like it could be effective if you practiced it over time?

[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

10. Would you be interested in continuing to use this technique when you begin to worry about this event?

[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

Appendix A-5

Laboratory and Follow Up – Recording Forms

ABCDE Exercise and Homework Tally Sheet

SIDE 1

(A)ctivating Event/Problem	Significant (B)elief	Emotional/Behavioral (C)onsequences	(D)isputation New, helpful belief	(E)ffective emotional/behavioral consequences

Adapted from Ellis, Gordon, Neenan, & Palmer, 1997

SIDE 2

Please practice your new belief exercise once a day for the next 7 days by thinking about your new belief and the effective emotional/behavioral consequences of that belief.
Mark a tally every time you practice, no later than *the end of the day.*

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Note: Side 1 will be completed in lab. Experimenter retained the original copy and made a copy for participant with "side 1" and "side 2" to be completed by participant over 7 days' time.

Appendix A-6

Follow Up - Recording Forms

Phone Call Interview

1. Did you practice your exercise? 2. If so, did you miss any days?

[no] [yes] [no] [yes]

3. Going down the past week, please tell me what days you used it and how many times on that particular day.

MON _____ TUES _____
WED _____ THURS _____
FRI _____ SAT _____ SUN _____

4. Did you find any benefit in dealing with the event that worries you the most by practicing?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

5. Did you have any difficulties in trying to practice?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

If so – what were they? _____

6. Did you find practicing the new thought enjoyable?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

7. Have you found you are experiencing any positive emotional/behavioral consequences since practicing this week?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

8. How likely are you to continue to use this technique after today for the thing you worry most about as well as other things that worry you?
[0] Not at all [1] Very little [2] A moderate amount
[3] A great deal [4] An extreme amount

9. Anything else you'd like to add regarding your experiences this week that I would find helpful to this study?
_____

Appendix A-7

Laboratory Forms

Qualitative Ratings of Experimenter Performance (for research assistant)

Pp ID #_____ Coder:_____ Length of Time: _____

Global Ratings of Experimenter Interactions In Lab

Knowledgeable	0 Low	1	2	3	4	5	6 High
Empathetic	0 Low	1	2	3	4	5	6 High
Positive Attitude	0 Low	1	2	3	4	5	6 High
Positive Mood	0 Low	1	2	3	4	5	6 High
Friendliness	0 Low	1	2	3	4	5	6 High

Adapted from the Motivational Interviewing Treatment Integrity Code (MITI), Forsberg et al. (2008)

Rational Disputation Manipulation Checklist for Experimental Groups (2)

Instructions: For non-verbal and verbal "must use" communication rows, please put a check mark in the "yes" or "no" box to denote if the experimenter completed each communication behavior. For verbal communication "may use" or "must not use", please mark a tally in the "yes" column for each time the experimenter has one of the following behaviors. If the experimenter does not use the behavior you may simply put a checkmark in the "no" box:

	YES	NO
Non-Verbal Communication		
1. Made eye contact with the participant		
2. Sat within 12-18 inches of the participant during RD exercise		
3. Spoke with soft, empathetic tone		
4. Had open-angled body posture when speaking with participant		
5. Pointed out information on sheet at least once		
6. Uses hand gestures to convey meaning		
Verbal Communication		
MUST USE		
1. Thanks participant for sharing worry story		

2. Asked permission to sit next to them		
3. Educated participant on the relationship between A-B-C		
4. Used understanding checks periodically like, “Does that make sense?”		
5. Reviewed A-B-C info from participants story for accuracy		
6. Asked participant to come up with one rational alternative suggestion and wrote it down		
7. Asked participant to come up with one or more emotional/behavioral consequences of new RB and wrote it down		
MAY USE		
1. Utterances and/or positive encouragers to convey understanding or transitioning to new task like, “great…ok…good…wow…that’s tough…”		
2. Asked to add in additional part of new RB for enhanced flexibility, e.g., “If I might add one thing here to just say, and if I don’t achieve this, it’s still ok”		
3. Asked about beliefs about event if participant does not talk about it		
4. Asked other clarifications during worry talk 1 like, “what are some of the emotional/behavioral consequences you are having about this worry?”		
MUST NOT USE		
1. Puts down, makes light of, or devalues participant by saying things like, “don’t worry about that”		
2. Give over-zealous reinforcement or “cheerleading” by saying things like, “you are a good person”		

Appendix B-1

Laboratory - Experimenter Script

Baseline: MMS 1 + State Anxiety 1

1. Non-talking BASE: ALL: 5 minutes

"For the next 5 minutes I'd like to establish a baseline reading of what your blood pressure and heart rate does just while you are sitting comfortably. No special instructions then, other than I'll ask you not to cross your legs as that may impede blood flow and affect your readings. I'll be back in 5 minutes, ok?"

2. Talking base READ: ALL: 2 minutes

"Ok, for the next 2 minutes I'd like you to read this very simple script out loud in your normal speaking voice. If you get through the whole thing before the 2 minutes is up, please just go back to the beginning and continue reading until the 2 minutes is up. You don't have to worry about the time as I'll come back and stop you when the 2 minutes are up, ok? You can start when you are ready."

3. Worry-Recall THINK1: ALL: 2 minutes

"I noticed on your survey that the thing you said worries you the most is _____. Is that still the case? Ok, on a scale of 1-10, just sitting here now, how worried does it make you to think about it? _____. Ok, what I would like you to do for the next 2 minutes is think about that event in as much detail as you can, for example, what the worst part about it is, how it makes you feel emotionally and even physically, and also some of the consequences of the event should it not work in your favor. Does that make sense? Ok, when I come back I will have you tell me about that event for 4 minutes, ok?"

4. Worry-Recall TALK1: ALL: 4 minutes

"Ok for the next 4 minutes I want you to go ahead and tell me about the thing that worries you the most. This is your chance to sort of "vent" and let it all out. If you run out of things to say before the time is up I may just ask you a few questions to keep you on track. While you talk I'll just be taking some notes. You can start when you are ready."

Experimenter completes ABC form

Post Worry Recall: MMS 2 + State Anxiety 2

5. MANIPULATION: Experimental Group – Disputation Intervention: 8 minutes

"Ok great, and Thank you for sharing your story with me. I'd like to take the next few minutes and walk you through a brief exercise where I can show you the connection between your beliefs about this event and how they affect how you're feeling if that's ok? Great! What I'd like to do is actually just come have a seat next to you so I can show you what I had been writing down on my notes. As you can see here, I have a table here with 5 columns. While you were telling me your story, I was able to fill in these first 3 columns labeled "Event", "Significant Belief", and "Emotional and Behavioral Consequences". Our beliefs about what it is we are worried about are significant, and typically actually self-defeating or dysfunctional because they tend to not be productive for us but instead lead to constant worrying which then becomes problematic because when we worry all the time the rest of our life suffers, which I'm sure you can understand? We also find that after thinking this way for so long that it seems as though this is the only real option and we start to feel almost stuck with this belief. What we know about the interaction between these 3 columns is that even though we may believe that it is the "event" that is causing us to feel the way we do, in actuality, it is the "beliefs" we hold about the event that causes the "emotional and behavioral" consequences…Does that make sense? What I'd like to do now is verify the details of your story that I have written down here. Ok?

Great. So in this first column "A" activating event or problem, you see that I wrote down _____ which is the event that worries you the most. From your story, I gathered that in the "B" column, "significant beliefs" that you believe you must/can't handle/can't stand _____. Is that accurate? Ok, finally in this column, "emotional or behavioral consequences" I wrote down that you feel _____. Would you say that's accurate? Ok.

So as I was saying before, even though we feel as though it is the problem or event that is causing our "emotional consequences", in actuality, it is our *beliefs* about the problem that causes our emotional consequences, and overtime, our beliefs can become rigid and inflexible, and eventually self-defeating. We can become stuck in the emotional consequences of those self-defeating beliefs. In reality, we are always going to have problems, that won't change, but we can be more flexible and reasonable in our beliefs which will help us in turn feel and act better and the point of this worksheet is to help you see that more clearly. Ok?

Now, that that is more clear, I'd like to ask you if you can think of an alternative thought or belief that is both totally feasible and realistic but also more helpful to the improve the way you are feeling and acting. It doesn't necessarily have to be something that you think you can simply snap your fingers and change the way you feel, it just should be something that you feel is a fair and rational alternative belief that you can have regarding your situation and I'll write it down here.

Ok, great! And finally, Can you think of a completely reasonable new emotional or behavioral consequence that might come as a result of your new belief and I will write it down here.

CONDITION 2 – CONTROL – Sit quietly in chair: 8 minutes

Ok for the next 5 minutes I'd like to continue to let the device take some readings, ok? I'll be back in 5 minutes.

Post Intervention: MMS 3

6. Worry-Recall THINK2: 2 minutes

Experimental CONDITION 1 – Experimental Group - Disputation Intervention

Great. Ok, for the next 2 minutes, I'd like you to study this piece of paper that we just worked on together. I'd like you to really think through these new beliefs and new outcomes and how they will be more helpful to you in problem solving and maybe even come up with a few more possible beliefs and outcomes in dealing with this problem. When I come back we'll talk about it for 4 minutes.

Experimental Condition 2 – Experimental Group 2 – Think Control

Great. Ok, for the next 2 minutes, I'd like you to think again about the thing that worries you the most that you told me about earlier. So again, just think about why it worries you so much, what some of the worst parts about it are, and the emotional and maybe physical symptoms you feel when you think about it. When I come back we'll talk about it for 4 minutes again.

CONDITION 2 – CONTROL

Ok for the next 2 minutes I'd like you to again think about that event that worries you the most, in the same manner asked I asked you to do before, thinking about all the reasons you are worried about the event and the consequences of what may happen if things don't turn out in your favor.

7. Worry-Recall TALK2: 4 minutes

CONDITION 1 – Experimental Group - Disputation Intervention:

Ok, Go ahead and talk me through what you learned from this process, for example, tell me about the connection you see between your beliefs and how they affect your emotional and behavioral consequences and then maybe tell me how you feel now with these new alternatives.

CONDITION 2 – CONTROL

Ok, go ahead and talk me through again what it is that worries you the most. If you've thought of new things this time around, let's start there and you can feel free to work in the things you told me the first time as well.

Post Think/Talk 2 Worry Recall: MMS 4 + State Anxiety 3

8. WRAP UP: ALL: 5 minutes

Great. As we are wrapping up here, I am going to continue to let the device take some last recordings for a few more minutes and then we'll be finished.

Manipulation check

Total Time 32 + 5 minutes excess, between task time = 37 minutes

9. Experimental Group Homework Assignment: 5 minutes

We are all done with the blood pressure recording session so I will now unhook you from the device. There is one final portion of this study. What we know about creating lasting change is that it takes practice, just like it takes practice to learn a new topic in class which you are well familiar with being a college student. Just as over time you developed self-defeating beliefs, you too can develop your new helpful alternative belief. The more actively involved you are in thinking about a new belief, the more likely it is that you will adopt it and you will be able to possibly achieve those new emotional and behavioral consequences. So with the same amount of energy you have been putting in to worrying, I'd like to you put into thinking about your new belief and the consequences that come from it. I am going to give you 3 copies of this worksheet that we completed today. This way you can put a copy in multiple places if that is helpful, like your wallet, or your fridge, or bathroom mirror and I'd like you to practice your new rational belief once a day, whenever it is convenient for you, though you may practice as many times a day as you'd like. The way you should practice is simply by thinking about the new belief and how it would positively affect your emotions and behavior just like you did here today which will take only a few minutes, but you can use as much time as you'd like. Then, simply put a tally down on this sheet immediately after you practice, if possible. If it's not possible, like if you were driving in your car, please put a tally down before the end of the day. Do not try and go back days later and mark tallies down because we know that memory tends to fail us. Also, keep in mind that this is truly meant to help you and so do not feel pressured! If you choose not to do this or you forget, that is okay. I will check in with you by phone at the end of the week to see how it went for you which will only take a minute or two. Do you have any questions about that?

10. Debrief: All: 1 minute

Before I let you go I want to debrief you and give you a little information about what this study is about. We are investigating the effects of cognitive restructuring on blood pressure. There were two groups in this study and one group was asked to change the way they thought about the thing they worry about the most and the other group was simply asked to think about what worries them most, but in the same manner of which they typically think about it. We are

measuring blood pressure and heart rate so we can compare what happens to the two groups across the length of the visit. Do you have any questions?

<u>For Control Group:</u> 5 minutes (following debrief)

I wanted to go ahead and take you through the exercise I did with the experimental group that you did not get today because it may be helpful for you in dealing with the thing you worry most about. *Takes Pp through experimental ABC protocol, see step 5 above.*

TOTAL LAB TIME: Approximately 58-60 minutes.

Appendix C-1

Survey Assessments – Online

Surveys Listed in Order Presented to Participants

Demographic Information

1. Gender

(1) man (2) woman

2. Age (in years) _____

3. Marital Status

(1) single (2) married (3) divorced (4) cohabitating but not married

4. What is your current work status (you may select two)?

(1) Full Time (2) Part Time (3) Homemaker (4) Student (5) Looking for Work

(0) If Disabled

5. Do you have biological children?

(1) yes (2) no

6. If yes, how many? And what are their ages?

7. What religious group do you belong to, if any? (Specify denomination for example Baptist, Methodist etc.)

8. College classification: (PLEASE SELECT ONE)

(1) Freshman (2) Sophomore (3) Junior (4) Senior (5) Other (please specify)

9. How do you identify your racial/ethnic background?

(1) Caucasian/White

(2) African-American/Black

(3) Spanish/Hispanic

(4) American Indian/Alaskan

(5) Native Hawaiian/Pacific Islander

(6) Asian

(7) Middle-Eastern

(8) Other (please specify below)

Appendix C-2

Survey Assessments - Online

Background, Health History

A. Are you currently engaged in therapy for a psychological concern?

B. If so, how long have you been attending therapy (any kind, for example: group, family, marital, one-on-one)?

Less than 1 month Between 1 month and 6 months Between 6 months and 1 year

Greater than 1 year I am not currently in therapy

C. If yes, for what concern do you see a therapist? If you are not in therapy, please enter N/A

D. Do you have a current (within the last year) diagnosis of major depression by your doctor?

E. If you have a diagnosis of depression in the past, what year was it given to you? If not, please enter N/A

1. PLEASE CHECK ALL THAT YOU HAVE EXPERIENCED IN YOUR LIFETIME.

0 = No 1 = Yes

Asthma Diabetes Drug or alcohol addiction Sleep Apnea

Cancer Restless leg syndrome Depression Headaches

Stroke High Cholesterol Hypoglycemia Ulcers

Heart Disease Hypertension (or high blood pressure) Insomnia Other

2. IF YOU ANSWERED YES TO "OTHER" ABOVE, PLEASE INDICATE THE CONDITIONS YOU HAVE EXPERIENCED IN YOUR LIFE TIME.

5. WHAT IS YOUR CURRENT WEIGHT? 6. WHAT IS YOUR HEIGHT (IN FEET)

7. WHAT IS YOUR HEIGHT (IN INCHES) 8. ARE YOU CURRENTLY SMOKING?

0 = No 1 = Yes

9. IF YOU CURRENTLY, SMOKE, HOW MANY PACKS OF CIGARETTES DID/DO YOU SMOKE PER DAY?

10. HOW MUCH ALCOHOL DO YOU DRINK PER WEEK?

NOTE: 1 beer = 12 oz. 1 wine = 4oz. and 1 shot or mixed drink = 1.5 oz. of hard liquor.

Appendix C-3

Survey Assessments – Online

Worry Question

Worry Most Question

1. At this current moment in your life, please describe what you worry about most in 1-2 sentences. It should be something that causes you distress when you think about it. It doesn't have to be a new event - it might even be something that hasn't happened yet. It is simply whatever it is that worries you the most when you think about it.

2. On a scale of 0-10, 10 being highest, to what degree does it worry you when you think about it?

0 1 2 3 4 5 6 7 8 9 10

Appendix C-4

Survey Assessments - Online

Rumination Response Scale (RRS)

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you "almost never", "sometimes", "often", or "almost always" think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do, in relation to what worries you most.

Rum1 think about how alone you feel
Rum2 think "I won't be able to do my job if I don't snap out of this"
Rum3 think about your feelings of fatigue and achiness
Rum4 think about how hard it is to concentrate
Rum5 think "What am I doing to deserve this?"
Rum6 think about how passive and unmotivated you feel.
Rum7 analyze recent events to try to understand why you are depressed
Rum8 think about how you don't seem to feel anything anymore
Rum9 think "Why can't I get going?"
Rum10 think "Why do I always react this way?"
Rum11 go away by yourself and think about why you feel this way
Rum12 write down what you are thinking about and analyze it
Rum13 think about a recent situation, wishing it had gone better
Rum14 think "I won't be able to concentrate if I keep feeling this way."
Rum15 think "Why do I have problems other people don't have?"
Rum16 think "Why can't I handle things better?"
Rum17 think about how sad you feel.
Rum18 think about all your shortcomings, failings, faults, mistakes
Rum19 think about how you don't feel up to doing anything
Rum20 analyze your personality to try to understand why you are depressed
Rum21 go someplace alone to think about your feelings
Rum22 think about how angry you are with yourself

1 = almost never
2 = sometimes
3 = often
4 = almost always

Appendix C-5

Survey Assessments - Online

Penn State Worry Questionnaire (PSWQ)

Select the number that best describes how typical or characteristic each item is for you in relation to what you worry about most.

PSWS1r If I don't have enough time to do everything, I don't worry about it.
PSWS2 My worries overwhelm me.
PSWS3r I don't tend to worry about things.
PSWS4 Many situations make me worry.
PSWS5 I know I shouldn't worry about things, but I just can't help it.
PSWS6 When I am under pressure I worry a lot.
PSWS7 I am always worrying about something.
PSWS8r I find it easy to dismiss worrisome thoughts.
PSWS9 As soon as I finish one task, I start to worry about everything else I have to do.
PSWS10r I never worry about anything.
PSWS11r When there is nothing more I can do about a concern, I don't worry about it anymore.
PSWS12 I've been a worrier all my life.
PSWS13 I notice that I have been worrying about things.
PSWS14 Once I start worrying, I can't stop.
PSWS15 I worry all the time.
PSWS16 I worry about projects until they are all done.

1 = Not at all typical
2
3
4
5 = Very typical of me

Appendix C-6

Survey Assessments - Online

CENTERS FOR EPIDEMIOLOGIC STUDIES OF DEPRESSION SCALE (CESD - R)

This questionnaire contains a list of ways you might have felt or behaved. Please answer each question by checking the circle that best describes how often you experienced each feeling or behavior.

CESD_1 My appetite was poor.
CESD_2 I could not shake off the blues.
CESD_3 I had trouble keeping my mind on what I was doing.
CESD_4 I felt depressed.
CESD_5 My sleep was restless.
CESD_6 I felt sad.
CESD_7 I could not get going.
CESD_8 Nothing made me happy.
CESD_9 I felt like a bad person.
CESD_10 I lost interest in my usual activities.
CESD_11 I slept much more than usual.
CESD_12 I felt like I was moving too slowly.
CESD_13 I felt fidgety.
CESD_14 I wished I were dead.
CESD_15 I wanted to hurt myself.
CESD_16 I was tired all of the time.
CESD_17 I did not like myself.
CESD_18 I lost a lot of weight without trying to.
CESD_19 I had a lot of trouble getting to sleep.
CESD_20 I could not focus on the important things.

(0) Not at all or less than one day
(1) 1-2 days last week
(2) 3-4 days last week
(3) 5-7 days last week
(4) Nearly every day for two weeks

Appendix C-7

Survey Assessments - Online

Pittsburgh Sleep Quality Index (PSQI)

1. During the past month, what time have you usually gone to bed at night?

Hour (1) Minutes (2) AM or PM (3)

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night? Please write number of minutes only.

3. During the past month, what time have you usually gotten up in the morning?

Hour (1) Minutes (2) AM or PM (3)

4. During the past month, how many hours of actual sleep did you get at night? (This may be difference than the number of hours you spent in bed.) Please write sleep length in number of hours using .5 to indicate half hours.

5. During the past month, how often have you had trouble sleeping because you...

	(0) Not during the past month	(1) Less than once a week	(2) Once or twice a week	(3) Three or more times a week
Cannot get to sleep within 30 minutes (1)	❍	❍	❍	❍
Wake up in the middle of the night or early morning (2)	❍	❍	❍	❍
Have to get up to use the bathroom (3)	❍	❍	❍	❍
Cannot breathe comfortably (4)	❍	❍	❍	❍
Cough or snore loudly (5)	❍	❍	❍	❍
Feel too cold (6)	❍	❍	❍	❍
Feel too hot (7)	❍	❍	❍	❍
Had bad dreams (8)	❍	❍	❍	❍
Have pain (9)	❍	❍	❍	❍

Other reason(s), please describe

How often during the past month have you had trouble sleeping because of this?

- ❍ (0) Not during the past month
- ❍ (1) Less than once a week
- ❍ (2) Once or twice a week
- ❍ (3) Three or more times a week

6. During the past month, how would you rate your sleep quality overall?

- ❍ (0) Very Good
- ❍ (1) Fairly Good
- ❍ (2) Fairly Bad
- ❍ (3) Very Bad

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

- ❍ (0) Not during the past month
- ❍ (1) Less than once a week
- ❍ (2) Once or twice a week
- ❍ (3) Three or more times a week

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activities?

- ❍ (0) Not during the past month
- ❍ (1) Less than once a week
- ❍ (2) Once or twice a week
- ❍ (3) Three or more times a week

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- ❍ (0) No problem at all
- ❍ (1) Only a very slight problem
- ❍ (2) Somewhat of a problem
- ❍ (3) A very big problem

10. Do you have a bed partner or roommate?

- ❍ (0) No bed partner or roommate
- ❍ (1) Partner/roommate in other room
- ❍ (2) Partner in same room, but not same bed
- ❍ (3) Partner in same bed

11. If you have a roommate or bed partner, ask him/her how often in the past month you have had...

	(0) Not during the past month (1)	(1) Less than once a week (2)	(2) Once or twice a week (3)	(3) Three or more times a week (4)
Loud snoring (1)	❍	❍	❍	❍
Long pauses between breaths while asleep (2)	❍	❍	❍	❍
Legs twitching or jerking while you sleep (3)	❍	❍	❍	❍
Episodes of disorientation or confusion during sleep (4)	❍	❍	❍	❍
Other restlessness while you sleep (5)	❍	❍	❍	❍

Please describe "other" restlessness while you sleep as listed above.

Appendix C-8

Survey Assessments – Online

Desirability of Control Scale (DOCS)

Below you will find a series of statements. Please read each statement carefully and respond to it 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.
2. I enjoy political participation because I want to have as much of a say in running government as possible.
3. I try to avoid situations where someone else tells me what to do.
4. I would prefer to be a leader than a follower.
5. I enjoy being able to influence the actions of others.
6. I am careful to check everything on an automobile before I leave for a long trip.
7. Others usually know what is best for me.
8. I enjoy making my own decisions.
9. I enjoy having control over my own destiny.
10. I would rather someone else take over the leadership role when I'm involved in a group project.
11. I consider myself to be generally more capable of handling situations than others are.
12. I'd rather run my own business and make my own mistakes than listen to someone else's orders.
13. I like to get a good idea of what a job is all about before I begin.
14. When I see a problem, I prefer to do something about it rather than sit by and let it continue.
15. When it comes to orders, I would rather give them than receive them.
16. I wish I could push many of life's daily decisions off on someone else.
17. When driving, I try to avoid putting myself in a situation where I could be hurt by another person's mistake.
18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.
19. There are many situations in which I would prefer only one choice rather than having to make a decision.
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.

Appendix C-9

Survey Assessments – Online

Brief COPE

Please complete the following questionnaire regarding the thing you worry most about discussed above.

These items deal with ways you've been coping with the stress in your life. There are many ways to try to deal with stressful problems. These items ask what you've been doing to cope with the thing you worry most about. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

Scale
1 = I haven't been doing this at all 2 = I've been doing this a little bit
3 = I've been doing this a medium amount 4 = I've been doing this a lot

1. I've been turning to work or other activities to take my mind off things.
2. I've been concentrating my efforts on doing something about the situation I'm in.
3. I've been saying to myself "this isn't real."
4. I've been using alcohol or other drugs to make myself feel better.
5. I've been getting emotional support from others.
6. I've been giving up trying to deal with it.
7. I've been taking action to try to make the situation better.
8. I've been refusing to believe that it has happened.
9. I've been saying things to let my unpleasant feelings escape.
10. I've been getting help and advice from other people.
11. I've been using alcohol or other drugs to help me get through it.
12. I've been trying to see it in a different light, to make it seem more positive.
13. I've been criticizing myself.
14. I've been trying to come up with a strategy about what to do.
15. I've been getting comfort and understanding from someone.
16. I've been giving up the attempt to cope.
17. I've been looking for something good in what is happening.
18. I've been making jokes about it.
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
20. I've been accepting the reality of the fact that it has happened.
21. I've been expressing my negative feelings.
22. I've been trying to find comfort in my religion or spiritual beliefs.
23. I've been trying to get advice or help from other people about what to do.
24. I've been learning to live with it.

25. I've been thinking hard about what steps to take.
26. I've been blaming myself for things that happened.
27. I've been praying or meditating.
28. I've been making fun of the situation.

Appendix C-10

Survey Assessments – Online

Generalized Anxiety Disorder – 7 (GAD-7)

Over the last 2 weeks, how often have you been bothered by the following problems?

1. Feeling nervous, anxious, or on edge	0 1 2 3
2. Not being able to stop or control worrying	0 1 2 3
3. Worrying too much about different things	0 1 2 3
4. Trouble relaxing	0 1 2 3
5. Being so restless that it's hard to sit still	0 1 2 3
6. Becoming easily annoyed or irritable	0 1 2 3
7. Feeling afraid as if something awful might happen	0 1 2 3

Not at all sure = 0
Several days = 1
Over half the days = 2
Nearly every day = 3

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

Appendix C-11

Survey Assessments – Online

General Self-Efficacy Scale

Please indicate the degree to which you believe each of the following statements would apply to you personally by indicating to the left of the item according to the following key:

SE1 I can always manage to solve difficult problems if I try hard enough.
SE2 If someone opposes me, I can find the means and ways to get what I want.
SE3 It is easy for me to stick to my aims and accomplish my goals.
SE4 I am confident that I could deal efficiently with unexpected events.
SE5 Thanks to my resourcefulness, I know how to handle unforeseen situations.
SE6 I can solve most problems if I invest the necessary effort.
SE7 I can remain calm when facing difficulties because I can rely on my coping abilities.
SE8 When I am confronted with a problem, I can usually find several solutions.
SE9 If I am in trouble, I can usually think of a solution.
SE10 I can usually handle whatever comes my way.

1 = Not at all true
2 = Hardly true
3 = Moderately true
4 = Exactly true

Appendix C-12

Survey Assessments – Online

John Henryism Active Coping (JHAC)

The questions below concern how you see yourself, today, as a person living and doing things in the real world. Read each question carefully and then check the response which best describes how you feel on the line next to the question. Each person is different, so there are not "Right" or "Wrong" answers. We would simply like an honest appraisal of how you generally see yourself.

JHAC1 - I've always felt that I could make of my life pretty much what I wanted to make of it.
JHAC2 - Once I make up my mind to do something, I stay with it until the job is completely done.
JHAC3 - I like doing things that other people thought could not be done.
JHAC4 - When things don't go the way I want them to, that just makes me work even harder.
JHAC5 - Sometimes I feel if anything is going to be done right, I have to do it myself.
JHAC6 - It's not always easy, but I manage to find a way to do the things I really need to get done.
JHAC7 - Very seldom have I been disappointed by the results of my hard work.
JHAC8 - I feel that I am the kind of individual who stands up for what he believes in, regardless of the consequences.
JHAC9 - In the past, even when things got really tough, I never lost sight of my goals.
JHAC10 - It's important for me to be able to do things the way I want to do them rather than the way other people want me to do them.
JHAC11 - I don't let my personal feelings get in the way of doing a job.
JHAC12 - Hard work has really helped me to get ahead in life.

1 = Completely False
2 = Somewhat False
3 = Don't Know
4 = Somewhat True
5 = Completely True

Appendix C-13

Survey Assessments – Online

Perceived Stress Scale (PSS)

Directions: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

PSS1 How often have you been upset because of something that happened unexpectedly?
PSS2 How often have you felt that you were unable to control the important things in your life?
PSS3 How often have you felt nervous and "stressed"?
PSS4 How often have you felt confident about your ability to handle your personal problems?
PSS5 How often have you felt that things were going your way?
PSS6 How often have you found that you could not cope with all the things that you had to do?
PSS7 How often have you been able to control irritations in your life?
PSS8 How often have you felt that you were on top of things?
PSS9 How often have you been angered because of things that were outside of your control?
PSS10 How often have you felt difficulties were piling up so high that you could not overcome them?

0 = Never 1 = Almost Never
2 = Sometimes 3 = Fairly Often
4 = Very Often

Appendix C-14

Survey Assessments – Online

Pre-Sleep Arousal Scale

During the pre-sleep period last night (in bed with the lights out before falling asleep for the first time), did you have any of the following experiences? Please indicate the degree to which you experienced each of those listed below. Do not include what you experienced during the middle of the night if you awakened after falling asleep.

1. Hear racing, pounding, or beating irregularly
2. A jittery, nervous feeling in your body
3. Worry about falling asleep
4. Review or ponder events of the day
5. Shortness of breath or labored breathing
6. Depressing or anxious thoughts
7. A tight, tense feeling in your muscles
8. Worry about problems other than sleep
9. Being mentally alert, active
10. Cold feeling in your hands, feet, or your body in general
11. Can't shut off your thoughts
12. Have stomach upset (know or nervous feeling in stomach, heartburn, gas, etc.)
13. Perspiration in palms of your hands or other parts of your body
14. Thoughts keep running through your head
15. Dry feeling in mouth or throat
16. Distracted by sounds, noise in the environment

1 = Not at all
2 = A little
3 = Moderately
4 = A lot
5 = Extremely

Appendix D-1

Miscellaneous

Study Advertisement

Appendix D-2

Miscellaneous

Online Survey Informed Consent

University of Wisconsin – Milwaukee
Consent to Participate in Online Survey Research

Study Title: Keep Calm and Retrain Your Brain

Person Responsible for Research: Marcellus Merritt, Ph. D., P.I. – Michelle Di Paolo, M.S., Student P.I.

Study Description: The purpose of this research study is to gain insight into the relationship between worry, stress, and coping styles. Approximately 300 subjects will participate in this study. If you agree to participate, you will be asked to complete an online survey that will take approximately 45 minutes to 1 hour to complete. The questions will ask you about your demographics like age, sex, religion, and race, health history, and a number of psychosocial assessments asking about your preferred coping activities, levels of worry, and how much social support you have in your life.

This is part one of a three part study. If you qualify for part two based on your survey responses, you may be contacted by phone and asked to voluntarily participate in a laboratory visit on-campus, in the basement of Garland/Pearse Hall, room B50. You will be randomly assigned to participate in one of two groups and also a 7 day follow-up period. The risks and benefits of the laboratory portion of this study will be explained thoroughly to you, should you qualify for the second portion of this study.

Risks / Benefits: Risks to participants are considered minimal. The questions that will be asked in this survey are commonly used in assessment of stress and coping and not considered to be highly controversial or alarming in anyway. Collection of data and survey responses using the internet involves the same risks that a person would encounter in everyday use of the internet (such as breach of confidentiality). While the researchers have taken every reasonable step to protect your confidentiality, there is always the possibility of interception or hacking of the data by third parties that is not under the control of the research team.

There will be no costs for participating. Benefits of participating include gaining insight into your self-selected coping activities, and also psychology course extra credit if you are enrolled in a course that offers extra credit. Completion of this survey is worth 1 total hour of extra credit. Only experimenters trained and certified in confidentiality standards will have access to any identifying information and only for the purposes of granting extra credit for your time.

Limits to Confidentiality:

Identifying information such as your name, email, and the Internet Protocol (IP) address of this computer will be collected for research purposes including contacting you to schedule a subsequent lab visit and administering extra credit to your SONA account. Your responses will

be treated as confidential and all reasonable efforts will be made so that no individual participant will be identified with his/her answers. Data will be retained on the Qualtrics website server for 1 year and will be deleted after this time. However, data may exist on backups or server logs beyond the timeframe of this research project. Data transferred from the survey site will be saved in an encrypted format for 2 years. Only Michelle Di Paolo (PI), Marcellus Merritt, and potentially other highly trained research assistants will have access to the data collected by this study. The research team will remove your identifying information after extra credit is granted to you and you have been assigned a unique ID number and all study results will be reported without identifying information so that no one viewing the results will ever be able to match you with your responses.

Voluntary Participation: Your participation in this study is voluntary. You may choose to not answer any of the questions or withdraw from this study at any time without penalty. Your decision will not change any present or future relationship with the University of Wisconsin Milwaukee.

Who do I contact for questions about the study: For more information about the study or study procedures, contact Michelle Di Paolo at mdipaolo@uwm.edu

Who do I contact for questions about my rights or complaints towards my treatment as a research subject? Contact the UWM IRB at 414-229-3173 or irbinfo@uwm.edu

Research Subject's Consent to Participate in Research:

By entering this survey, you are indicating that you have read the consent form, you are age 18 or older and that you voluntarily agree to participate in this research study.

Thank you!

- ○ YES – I agree to these terms
- ○ NO – I do NOT agree to these terms

Appendix D-3

Miscellaneous

In-Lab Written Informed Consent

UNIVERSITY OF WISCONSIN – MILWAUKEE

CONSENT TO PARTICIPATE IN RESEARCH

UWM STUDENT CONSENT FORM

1. General Information

Study title: Keep Calm and Retrain Your Brain

Person in Charge of Study (Principal Investigator): Marcellus Merritt, Ph.D., P.I. - Department of Psychology: UWM

Study Description

You are being asked to participate in a research study. Your participation is completely voluntary. You do not have to participate if you do not want to.

This is part two of a three part study. Only some participants are randomly assigned to part three; see study description below. You have qualified for this portion of the study (part two) based on your survey responses on part one of this study that you completed at an earlier time during your online survey completion.

Study description:

The current study was developed out of the need to determine if a relationship exists between levels of perseverative cognition (worry and rumination) and cardiovascular responding when engaging in a cognitive reframing task. This information will contribute to the breadth of research involving the benefits of effective coping with stress and may reveal more evidence for the benefits of cognitive reframing. It will also provide data which ultimately can be used in an applied setting, assisting those who are considered high-risk for, or are currently suffering from, the negative effects of stress and may benefit from enhanced cognitive coping skills.

This study is being conducted first online where survey data will be collected. The second part of this study will be conducted on the UWM campus at a psychology laboratory, Pearse Hall, room

B50. Approximately 450 UWM students will participate in the survey portion of this study, approximately 40 of which will be selected to participate in the second, laboratory portion. Those randomly assigned to the experimental group of this study will also be asked to complete a 7 day follow-up take-home cognitive reframing practice task.

The laboratory portion (part 2 that happens now) will take approximately 1 hour. You will be randomly assigned to one of two conditions, one group of which will be asked to complete part 3 of this study, i.e., 7-day follow up portion. You will be notified during the lab visit today if you were assigned to the 7 day follow up period. The experimenter will not know what condition you are assigned to until the middle of the lab visit today. If assigned to complete the homework for 7 days, this task should take no more than a total of approximately 30-60 minutes in total.

Study Procedures

What will I be asked to do if I participate in the study?

If you agree to participate you will be asked to

- If you agree to participate, data will be collected in the basement of Pearse Hall, room B50. If randomly assigned to the experimental group, you will also be asked to participate in a 7 day follow-up period where you will complete a take-home assignment.

Detailed Lab Procedure:

NOTE: If you agree, your lab visit will be video recorded and will be stored and analyzed on a private, password secured lab computer hard drive, with only a randomized participant number associated with your video. The purpose of this is to ensure a high degree of experimenter procedural quality. The video will be deleted after 2 years or sooner, upon completion of this study. If you choose not to be recorded, you will still be able to participate in this visit.

- First, the experimenter will measure your resting blood pressure and heart rate by placing a blood pressure cuff around your upper arm for 3 total measurements. (2 minutes)

- Next, you will be asked to participate in a series of mental tasks while we continuously monitor your blood pressure and heart rate. The experimenter will place finger cuffs on the index and middle fingers of your non-dominant hand to collect continuous measures of blood pressure and heart rate. The steps involve first, a 5 minute baseline period where you sit quietly. Then you will read a short neutral passage out loud (2 minutes).

- Following, a mental task will involve recalling and telling the experimenter about a past experience that made you worry (6 minutes total).

- Immediately after that will involve one of two situations: 1. Sitting quietly in a chair (8-10 minutes) or 2. Engagement in a cognitive rational disputation exercise (8-10 minutes). This exercise will involve a) education on the relationship between worry and emotional/behavioral outcomes and b) reframing worry into a helpful and proactive thought while determining the positive emotional/behavioral consequences of this new reframed thought.

- Both groups will then be asked to again think (2 minutes) and talk (4 minutes) about the experience they worry most about.

- Finally, both groups will engage in a 5 minute mental rest period (5 minutes).

Short mood ratings will be taken before the first blood pressure measurements, after each mental task, and at the end of the session. Also, your perceptions of the conditions listed above period will be measured. (5 minutes)

- If in the experimental group, you will be given instructions on a take-home assignment. If not, you will be debriefed regarding the purpose of this study and then are free to go.

Risks and Minimizing Risks

What risks will I face by participating in this study?

This study poses no more than minimal risk, in accordance with your normal activities of daily living. You will be asked to recall and talk about the experience that currently worries you the most while the experimenter records down details of your story. You will be asked to think and talk about the situation in a way that is already typical to your life and how you think about the experience.

You may experience minimal and temporary discomfort in your arm while your blood pressure is being assessed. The discomfort will be the same discomfort felt when your blood pressure is taken at a doctor's office. If you feel uncomfortable for any reason, you may withdraw from the study at anytime without penalty.

All research assistants involved in this study are highly trained in the assessment of BP and heart rate and have been trained how to report any unexpected problems. If you have a BP reading(s) in the severe hypertensive range (i.e., systolic/diastolic BP > 180/120 mmHg) or in the hypotensive (or very low range; systolic/diastolic BP < 80/50 mmHg) you will be immediately referred to your regular physician or to the Norris Health Center for further consultation. Note

again that these BP levels are extremely rare in a healthy young adult population. We have the contact information of the Norris Health Center to refer you to in the instance that you have abnormal BP readings and need follow-up.

Benefits

Will I receive any benefit from my participation in this study?

1) You may gain further understanding of their preferred method of coping with stress.

2) You may also enhance your ability to cope with worrisome thoughts.

Study Costs and Compensation

Will I be charged anything for participating in this study?

- You will not be responsible for any of the costs from taking part in this research study.

Are subjects paid or given anything for being in the study?

- You will receive 1 hour of extra credit for your completion of this portion of the study and 1 extra hour if you are randomly assigned to 7-day follow-up period if extra credit is offered in your psychology courses. If you are NOT assigned to the follow up portion (part 3) of this study, your study participation is done after the lab visit today and therefore you will not be eligible for anymore extra credit hours. No financial compensation will be given. You will receive a keychain stress ball to take home and keep.

Confidentiality

What happens to the information collected?

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. We may decide to present what we find to others, or publish our results in scientific journals or at scientific conferences. Only the PI and other highly trained personnel will have access to the information. However, the Institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

The information included in this study will be kept confidential and will be available only to qualified personnel associated with this study. All data will be kept under lock and key and will be analyzed in group form for the entire sample. The results of the tests may be published for scientific purposes, but your identity will not be revealed.

All hard copies of data will be kept under lock and key and all electronic copies stored on a password protected computer for the length of five years. After that time, data will be destroyed.

We may use your direct quotes, but only when directly applicable to the study aims and when it will greatly serve the research community to be aware of such direct quotes. These quotes will be totally de-identified and will not be associated with you or your information in any way, shape, or form.

Alternatives

Are there alternatives to participating in the study?

- There are no known alternatives available to you other than not taking part in this study.

Voluntary Participation and Withdrawal

What happens if I decide not to be in this study?

Your participation in this study is entirely voluntary. You may choose not to take part in this study. If you decide to take part, you can change your mind later and withdraw from the study. You are free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with the University of Wisconsin Milwaukee.

Your refusal to take part in the study will not affect your grade or class standing. If you withdraw from any stage of this study your data will not be included in any datasets or analyses if you so request. Otherwise, we may or may not use your data depending on when you withdraw.

Questions

Who do I contact for questions about this study?

For more information about the study or the study procedures or treatments, or to withdraw from the study, contact:

Michelle Di Paolo, M.S.
Department of Psychology
2441 E. Hartford Ave.
Milwaukee, WI 53211
mdipaolo@uwm.edu

Who do I contact for questions about my rights or complaints towards my treatment as a research subject?

The Institutional Review Board may ask your name, but all complaints are kept in confidence.

Institutional Review Board
Human Research Protection Program
Department of University Safety and Assurances
University of Wisconsin – Milwaukee
P.O. Box 413
Milwaukee, WI 53201
(414) 229-3173

Signatures

Research Subject's Consent to Participate in Research:

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study, you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read or had read to you this entire consent form, including the risks and benefits, and have had all of your questions answered, and that you are 18 years of age or older.

_____

Printed Name of Subject/ Legally Authorized Representative

_____ _____

Signature of Subject/Legally Authorized Representative Date

It is okay to video record me while I am in this study and use my video data in the research.

Please initial: ____Yes ____No

I give permission to use my direct quotes from the laboratory visit and/or the 7 day follow-up period (if applicable) for research purposes only. I understand that my quotes will not in any way be attributed to me and my identity in the case that my quote is used will be hidden.

Please initial: ____ Yes ____ No

I understand that I may or may not be randomly assigned to complete part 3 (7 day follow-up take home practice) portion of this study for an additional 1 hour of credit, but that I will not find out until the middle of the laboratory visit today. If I am not assigned to complete the follow up period, my participation in the study is complete following the lab visit today and I am not eligible for any additional extra credit.

Please initial: ____Yes ____ No

Principal Investigator (or Designee)

I have given this research subject information on the study that is accurate and sufficient for the subject to fully understand the nature, risks and benefits of the study.

_____	_____
Printed Name of Person Obtaining Consent	Study Role
_____	_____
Signature of Person Obtaining Consent	Date

Michelle Rosalie Di Paolo

1420 E. Capitol Dr. #201
Shorewood, WI 53211
MDiPaolo@uwm.edu
847-293-0544

Education

University of Wisconsin – Milwaukee, Milwaukee, WI
Ph.D., Experimental Health and Social Psychology
Minors: Neuroscience, Psychopathology
Received May, 2016
Dissertation: A Brief Rational Disputation Exercise Enhances Cardiovascular, Anxiety, and Affective Recovery Following Worry-Recall

University of Wisconsin – Milwaukee, Milwaukee, WI
M.S., Experimental Health and Social Psychology
Received December, 2013
Thesis: Walk it off!: The Relationship Between Physically Active and Passive Coping and Perseverative Cognition

Stephen F. Austin State University, Nacogdoches, TX
M.A., Psychology
Received August, 2009

Northern Illinois University, DeKalb, IL
B.A., Psychology
Minors: Biology, Philosophy
Received May, 2007

William Rainey Harper College, Palatine, IL
Certified nursing assistant (CNA) certification
Received June, 2005

Honors and Awards

Award for Teaching Excellence, UWM, Dec. 2013
Graduate Research Committee Award, UWM, May 2012
Outstanding Graduate Research Award, SFA, April 2009

Clinical & Research Interests

Translational medicine, health psychology, cardiovascular psychophysiology, stress, coping, sleep dysfunction, pain management, tailored, person-focused interventions, CBT, mood-enhancement, human sexuality, positive psychotherapy, mindfulness meditation

Publications

Trost, S. E., & Di Paolo, M. R. (2016). Paraphilic disorders. In B. Burke, S. E. Trost, T. DeRoon-Cassini, M. T. Nietzel, E. A. McCauley, D. A. Bernstein, & M. L. Speltz (Eds.), Abnormal Psychology (pp. 573-604), Cleveland, OH: Yolo Publishing.

Trost, S. E., & Di Paolo, M. R. (2016). Sexual Dysfunctions and Gender Dysphoria. In B. Burke, S. E. Trost, T. DeRoon-Cassini, M. T. Nietzel, E. A. McCauley, D. A. Bernstein, & M. L. Speltz (Eds.), Abnormal Psychology (pp. 415-438), Cleveland, OH: Yolo Publishing.

Berger, L., & Di Paolo, M. R. (2015, May 21). Screening, Brief Intervention, and Referral to Treatment (SBIRT): An Interview with Scott Caldwell, M.A., and Darla Spence Coffey, Ph.D. *Journal of Social Work Practice in the Addictions*, 15(2).

Manuscripts in preparation

Merritt, M. M., Zawadzki, M. J., Di Paolo, M. R., & Gerin, W. G. *Self-selected relaxing activities predict similar cardiovascular recovery to anger recall as mindfulness meditation.*

Merritt, M. M., Di Paolo, M.R., Edwards, C. L. Koenig, H.G., Bennett, G. G., &Whitfield, K.E. *Put a little prayer in your John Henryism! Religiosity and cardiovascular responses to racism active speech and anger recall for African American men.*

Di Paolo, M. R., Merritt M. M. *Walk it Off!: The relationship between physically active and passive coping and perseverative cognition.*

Conference Presentations

Berger, L., Di Paolo, M. R. (2016, June). *Organizational factors associated with adoption and implementation of screening, brief intervention, and referral to treatment for substance misuse.* Poster to be presented at the Research Society on Alcoholism, New Orleans, LA.

Merritt, M. M., Zawadzki, M. J., Di Paolo, M. R. (2016, March). *Want better sleep and less depression? Put more distracting activity in your daily life.* Poster presented at the American Psychosomatic Society Conference, Denver, CO.

Stoiber, L. C., Kienzler, S., Pfeiffer, H. M., Di Paolo, M. R., Fleming, R., & Reddy, D. M. (2015, April). *Measuring actual change to inform course/institutional assessment.* Office of Professional and Instructional Development Conference, Green Lake, WI.

Di Paolo, M. R., Merritt, M. M., (2015, April). *Not Created Equal: Sex Differences in Stress Appraisal and Type of Personal Coping Activity.* Poster presented at the Society of Behavioral Medicine Conference, San Antonio, TX.

Di Paolo, M. R. (2014, March). *Walk it off!: The Relationship Between Physically Active and Passive Coping, Perseverative Cognition, and Mood Enhancement.* Poster presented at the American Psychosomatic Society Conference, San Francisco, CA.

Di Paolo, M. R., Hodge, M.H., & Merritt, M. M. (2013, May). *Walk it off!: Physically active coping styles and perseverative cognition.* Poster presented at the Midwest Psychological Association Conference, Chicago, IL.

Merritt, M. M., Di Paolo, M. R., Hodge, M. H., & Zawadski, M. (2013, March). *Be encouraged!: Striving at low childhood socioeconomic status predicts vascular recovery to post-anger recall distraction, but not rumination.* Poster presented at American Psychosomatic Society Conference, Miami, FL.

Graves, N. L., Di Paolo, M.R., & Merritt, M. M. (2011, April). *Stay Positive!: More life satisfaction is associated with a better awakening cortisol response on exam day for college students.* Poster presented at the Association of Graduate Students in Psychology Conference, Milwaukee, WI.

Di Paolo, M. R. (2009, April). *Investigations in Novel Life Event Stressors and Perceived Stress.* Poster Presented at the annual Southwest Psychological Association Conference, San Antonio, TX.

Oral Presentations

Di Paolo, M. R. (2016, April). *A Brief Rational Disputation Exercise Enhances Cardiovascular, Anxiety, and Affective Recovery Following Worry-Recall.* Symposia conducted at University of Wisconsin-Milwaukee for the Association of Graduate Students in Psychology (AGSIP), Milwaukee, WI.

Di Paolo, M. R. (2014, April). *Walk it Off!: The Relationship Between Physically Active and Passive Coping and Perseverative Cognition.* Symposia conducted at University of Wisconsin-Milwaukee for the Association of Graduate Students in Psychology (AGSIP), Milwaukee, WI.

Behavioral Health Care Clinical Experience

Froedtert/MCW, Health Psychology Counseling Intern – Wauwatosa, WI, Sept., 2015 – May, 2016 (8 months)

- Counseled patients and families suffering from various stages of hematologic cancers through the use of multiculturally-focused CBT and interpersonal counseling techniques

- Administered a number of psychological assessments under supervision including: drug/alcohol screenings, mental status exams, anxiety/depression screenings, and cognitive dysfunction assessments
- Provided psychoeducation to patients regarding behavioral activation, stress and coping, and relaxation training including deep breathing, guided imagery, and mindfulness
- Ran smoking cessation interventions cooperatively with the pharmacy staff for those patients trying to quit smoking
- Evaluated patients prior to their bone marrow transplant to assess for mental health issues and potential barriers to post transplant adjustment
- Conducted psychosocial interviews on newly diagnosed cancer patients arriving to the hospital on an emergency basis for treatment to assess for mental health concerns
- Worked closely on patient care-planning via team-based model with MDs, NPs, PTs, PAs, and various direct-care staff
- Charting conducted via EPIC systems

Glenkirk, Program Director/Qualified Service Professional (QSP) – Northbrook, IL, June 2010 – July 2011 (1 year, 1 month)

- Managed the complete care of adults with developmental as well as other physical and mental disabilities including but not limited to: Autism spectrum d/o, seizure d/o, Cerebral Palsy, Pica, Cornelia de Lange syndrome, Cri Du Chat syndrome, profound mental retardation
- Coordinated staff, guardian, supervisor, and nursing meetings
- Hosted and directed client annual care plan meetings
- Conducted multiple client assessments including the SIS and ICAP
- Developed and implement individualized service plans per client
- Attend neurological, psychological, dental, surgical, etc. medical appointments
- Supervised a direct care staff of 20 employees
- Organized staff schedules, training responsibilities, and payroll issues
- Carried out disciplinary action of staff when necessary
- Trained staff in communication techniques for non-verbal clients
- Constructed communication materials (e.g., magnetic pictures) for non-verbal clients
- Maintained a caseload of 15 clients

Somerset Place, Case Manager/Psychosocial Rehabilitative Services Counselor (PRSC) – Chicago, IL, January 2008 – June 2008, and Oct. 2009 – Dec. 2009 (7 months total)

- Counseled residents who suffer from a number of disorders including schizophrenia, bi-polar disorder, and are comorbid for substance abuse
- Ran urinalysis tests on residents who are suspected of using drugs or alcohol
- Conducted therapeutic coping skills groups three days a week to higher functioning residents as a way of learning what stress is, positive coping techniques, problem solving strategies, and physical and mental side effects of

stress
- Intervened in physical and verbal altercations between residents
- Interfaced with the nurses and physicians of any change in mental stability
- Guided and managed the care of residents who needed assistance getting clothing, finding a job, or wishing to find alternate housing
- Documented and charted instances of mental, emotional, or physical resident instability
- Created as well as updated residents' care plans to maximize their discharge potential and quality of living
- Audited resident charts for accuracy and updated forms/assessments when needed
- Responsible for a caseload of between 25-35 residents

Z Frank Apachi Day Camp, Gymnastics Coach – Northbrook, IL, May – Aug. 2001 and May – Aug. 2002 (6 months total)
- Coached children ages 5-13 with various developmental disabilities including Autism spectrum disorders, ADHD, conduct disorder, learning disability, and other various developmental disorders
- Adjusted lesson plans to safely incorporate children with ID/DD during various gymnastics activities
- Adapted the gym to accommodate children in wheelchairs or with other physical disabilities in order to encourage their participation to the greatest of their abilities

Research Experience

Laboratory Manager/Research Assistant: Stress, Coping, and Health Disparities Laboratory: Dr. Marcellus Merritt, PI, Aug. 2011 – present (4 years, 9 months)
- Implementation of experimental protocols with the use of various software/hardware
  - PORTApres portable blood pressure device
  - Beatscope software that records and analyses cardiovascular data
  - Kubios software that analyses heart rate variability data
  - Ambulo 2400 ambulatory blood pressure monitor and software
  - Polar heart rate monitors/devices
  - Mindful meditation techniques and tailored relaxation
  - Reflective listening and motivational interviewing
  - SPSS 22 statistics package
- Analyze data using various statistical programming like SPSS and Excel
- Qualitative data coding and analysis
- Maintain laboratory hardware and data collection machinery
- Designing and implementing Qualtrics Online Surveys
- Complete Internal Review Board (IRB) procedures and applications
- Contribute to the development and completion of grant applications
- Design advertisements for multiple laboratory studies

- Create, design, adapt, and execute psychophysiological experimental in-lab and ambulatory protocol
- Mentor and train a total of 11 undergraduate research assistants in the daily activities of the laboratory including data analysis, experimentation procedures including using survey tools and methodology of the participant interview

Laboratory Projects

A Brief Rational Disputation Exercise Enhances Cardiovascular, Anxiety, and Affective Recovery Following Worry-Recall – Aug., 2015 – May, 2016: Principle Investigator: Michelle R. Di Paolo

- This study investigated the use of a brief rational disputation exercise as a means of helping those with high levels of perseverative cognition (PC) cope more effectively following a worry-recall session. High PC individuals came into the lab and after engaging in a psychological stressor (recounting the situation that currently worries them most) and were randomly assigned to either the control condition - sitting quietly in a chair for 8 minutes, or the experimental condition – a brief 8 minute rational disputation exercise. Measures of blood pressure, heart rate, and subjective affect and state anxiety were collected using the Portapres monitor and the momentary affect scale and the state anxiety scale. It was determined that higher levels of PC are associated with worse sleep quality, and getter amounts of anxious and depressive symptomatology. Furthermore, PC was associated with less active (behavioral) coping and less general self-efficacy. It was also found that following a worry-recall session, those with high PC experience a reduction in BP/HR, reduction in negative affect, and an increase in positive affect significantly more than simply sitting quietly in a chair. Participants also continued to engage in the activity for 1-week following the study when asked to do so, enjoyed it, and felt they would continue using it.

Self-Selected Activities and Ambulatory Blood Pressure (SSAMBA) – June 2014 – On-Going: Principle Investigator: Marcellus Merritt

- For this study, we are utilizing ambulatory blood pressure equipment to capture the effects of stress and coping in a highly useful way, i.e., the participant's normal environment. We are gathering approximately 24-hour's worth of data utilizing a Polar heart rate monitor as well as an Ambulo 2400 blood pressure cuff. These devices produce a wide range of blood pressure and heart rate data both during the day and overnight which increases the external validity of this study (versus in lab only manipulation) to a great extent. We aim to determine if engaging in self-selected relaxation affects nighttime blood pressure dipping when compared to refraining from engagement in this relaxing activity. We are currently in year one of data collection for this study and anticipate approximately one to two more years for data collection.

Walk it Off! – Aug., 2012 – Dec., 2014: Principle Investigator: Michelle R. Di Paolo

- This study investigated the moderating effects of perseverative cognition (PC) (i.e., worry/rumination) and desire for control on one's self-selected coping style of either physically active (PAC) or physically passive (PPC) coping techniques when very stressed/angry. Participants (only self-selected PACs) came into the lab and after engaging in a psychological stressor (recounting a highly stressful/angry event) and were

randomly assigned to either a control condition, i.e., sitting quietly in a chair for 10 minutes, or a physically active condition, i.e., walking on a treadmill at a self-selected pace for 10 minutes. Measures of blood pressure, heart rate, and subjective mood were collected using the Portapres monitor and the momentary mood scale. It was determined that PC is associated with desire for control in that those with high PC have significantly higher desire for control than those with low PC. It was also determined that those with high PC who were also self-selected PACs experienced significantly enhanced positive mood when walking on a treadmill than while sitting in a chair after an anger-recall stressor task.

Stress Management and Coping Study – Aug. 2011 – May 2013: Principle Investigator: Marcellus Merritt

- This study's main aim was to gain knowledge of, and empirically test the effectiveness of self-selected coping activities (SSAs) when coping with stress. Participants filled out a questionnaire telling us what their preferred activities are to cope with stress. Then, we brought participants to the lab twice for a within-subjects comparison, where for one visit they would engage in mindfulness meditation (participants were naïve or low experience meditators) and for their second visit, instead engaged in the coping activity they currently use and like the most when dealing with stress. The Finapres Portapres monitor was used to assess blood pressure and heart rate. Data processing for this study is ongoing.

Evaluation Manager/Research Assistant – Center for Applied Behavioral Health Research: Dr. Lisa Berger, PI: Screening, Brief Intervention, Referral to Treatment (SBIRT) SAMHSA Grant: 1U79TI025412-01, January 2014 – Present (2 years, 4 months)

- Design assessments and evaluations utilizing Teleform 10.8 design software
- Qualitative data coding and assessment
- Online survey design, implementation, and troubleshooting via Qualtrics
- Implement training evaluation packets at various training sites, like hospitals and medical colleges, to medical residents, physicians, nurses, and social workers
- Mastery in use and adaptation of "The Dillman Method" of longitudinal research
- Advanced training and knowledge of Motivational Interviewing and Reflective Listening techniques
- Analyze and prepare data into manuscript form
- Interface with medical professionals regarding tailoring training to meet their needs

Researcher: Extracurricular Learning – Physiology Laboratory, Stephen F. Austin State University, May 2009 – July 2009 (2 months)

- Trained to use various experimental equipment including:
  - Blood pressure cuff
  - Stationary exercise bike equipped with weights
  - "Hot Box"
  - Body composition calipers
  - Medical grade treadmill
- Trained on various data collecting techniques and theories including:

- $V0^2$ Max – Aerobic Respiration Output
- Wingate test – Anaerobic Respiration Output
- Excess Post-Exercise Oxygen Consumption (EPOC) Output
- Respiratory Exchange Ratio (RER) Output
- Electrocardiogram equipment (ECG)

Principal Investigator – Stephen F. Austin State University, Sept. 2008 – Aug. 2009 (1 year)

- Complied extensive research regarding the physiological and psychological effects of stress on the body
- Designed a research experiment investigating novel life event stressors and perceived stress
- Wrote a grant-style research proposal
- Completed an IRB proposal
- Executed research using online survey programming
- Utilized SPSS in analysis of the study results
- Edited and finalized a complete APA style research paper

Community in Schools Research Assistant - Dr. Christine Malecki, Northern Illinois University, Jan. 2007 - May 2007 (4 months)

- Commuted to elementary and junior high school in Aurora, Illinois
- Explained and administered various evaluations to the students
- Assisted in translation for Spanish-speaking students
- Translated information in Spanish and utilized non-verbal body language to convey meaning
- Collected and entered data
- Carefully monitored for invalid surveys which would deter accurate results

Undergraduate Research Assistant - Dr. Brad Sagarin, Northern Illinois University, Jan. 2006 - Dec. 2006 (1 year)

Compliance Experiment

- Lead an experiment where I acted as lead confederate responsible for administering a pretest then engaging in deception in order to evaluate participant compliance
- Ran a post-test suspicion probe after debriefing participants

Cross Talk Experiment

- Investigated the effects of students sharing secretive information
- Monitored for deception among participants

Jealousy Experiment

- Administered surveys
- Carefully coded data in order to detect invalid surveys which was important to defer false positive reactions in interpretation of the data

Teaching Experience

Associate Lecturer and Teaching Assistant, University of Wisconsin – Milwaukee,

Milwaukee, WI, August, 2012 – December, 2015

- Introduction to Psychology – 3 credit hours – Five semesters

All duties listed below at Cardinal Stritch as well as the following:

- Managed approximately 300 students per semester
- Utilized D2L online classroom management system using the content, quiz, grade book, drop box, and newsfeed functions
- Worked cooperatively weekly with the supplemental instruction tutor

Adjunct Instructor, Cardinal Stritch University, Milwaukee, WI, August, 2011 – May, 2012, and January, 2014 – May, 2014

- General Psychology – 3 credit hours – Two semesters
- Human Sexuality – 3 credit hours – Two semesters
  - Incorporated relevant and up-to-the-minute news stories and video footage into class lecture and discussion
  - Designed syllabus material originally, including goal objectives, class meeting dates, class expectations, and penalties for late/missing work
  - Maintained class' online learning management system via ANGEL website
  - Created all original exams, homework assignments, paper topics, quizzes
  - Graded all exams, homework assignments, papers, quizzes
  - Implemented the use of supplemental textbook materials including online quizzes, and access to additional notes and learning devices
  - Allowed for extra credit assignments including participation in psychological research conducted at Stritch
  - Communicated with department secretary and department chair at least biweekly in regards to administrative tasks and duties
  - Made photocopies of class exams, handouts, etc.
  - Recorded class attendance biweekly using the Strtich online attendance tracker
  - Reported the progress of at-risk students to their counselors in monthly reports including information about their class participation, grades, and over-all attitude

Teaching Assistant, Adjunct Professor Patricia Foster, Fall, 2008 and Dr. Rhiannon Fante, Spring 2009, Stephen F. Austin State University

- Fall, 2008 - Learning and Study Skills, Introduction to Psychology, Human Sexuality
- Spring, 2009 - History and Systems, Behavior Modification, Organizational Behavior Management
  - Lectured on various topics in the courses listed above in lecture halls of 120+ students
  - Planned and implemented class lecture material including handouts, PowerPoint slides, video clips, and classroom activities
  - Designed syllabi and class schedules
  - Hosted office hours weekly to assist students
  - Proctored exam periods

- Facilitated, and organized study sessions after school hours for students
- Developed study guides for examinations
- Answered e-mails regarding questions students had
- Graded homework, quizzes, exams
- Entered students grades online via SFA's MyCourses website
- Impromptu hosting of lectures when above professors were sick or unavailable

Reviewer

American Psychosomatic Society (November, 2014)
- Reviewed, evaluated, and scored presentation submissions for APS conference

Grants Received

Recipient (2015). Health Psychology Graduate Student Club, Center for Student Involvement Travel Grant. Received $510 for travel to present at the Society of Behavioral Medicine Conference.

Recipient (2014). Graduate School Travel Grant. Received $450 for travel to present at the Psychosomatic Medicine Conference.

Recipient (2012). Graduate Research Committee Award, Received $3,100 in order to conduct summer research.

Certifications

IHSA and WIAA Gymnastics Official – Nov. 2007 – present
CPR/AED/First Aid: American Red Cross – 2003 – 2013
CITI Human Subjects Training – September, 2005 and August, 2012
Qualified Services Professional (QSP): IDHS – August, 2010
IDHS Medication Administration – August, 2010
Safety and Risk Management: USA Gymnastics – October, 2009
Certified Nursing Assistant (CNA) – June, 2005

Committee Memberships

Health Psychology Graduate Students Association – Treasurer, 2013 – present
Association of Graduate Students in Psychology – Vice President, 2013 – 2014
American Correctional Association - Member, 2005 – 2009
Student Psychological Association - Member, 2005
Pre-Professional Association - Member, 2004

Professional Memberships

American Psychological Association: 2015-2016

Clinical and Translational Science Institute: 2014-2015
Association of Psychosomatic Society: 2014-2015
Society of Behavioral Medicine: 2014-2015
American Academy of Pain Management: 2014-2015
Midwestern Psychological Association: 2012-2013

Volunteer Work

Special Olympics coach and assistant, Jan. 2002 – Dec. 2006

- Coached gymnastics to children and adults ages 6-28 with various developmental and intellectual disabilities