

BUDDHISM IS MORE THAN JUST MEDITATION: A COGNITIVE NONATTACHMENT
TRAINING FOR SOCIAL STRESS

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MASTER OF SCIENCE

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ABSTRACT

Buddhism is essentially a cognitive-behavioral intervention where oral teachings and meditation work together to develop nonattachment, a mind-state considered to be the antidote to all human suffering. The present work investigated a twelve-minute cognitive nonattachment induction that taught a wisdom training called the “Three Marks of Existence.” We expected nonattached attitudes to increase following the training. Anxious reactivity to a public speaking task was also expected to be reduced. Results were mixed, and suggested that the training increased agreement with nonattachment world-views, and reduced threat appraisals as hypothesized. However, the training generally did not reduce anxiety measures, although it was effective across several measures among women. These results suggest that nonattachment could be an important mind-state for mitigating the emotional and social stressors inherent to everyday life, and that more research is needed to better understand the cognitive and behavioral development on nonattachment.

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INTRODUCTION

In his first formal teaching, the Indian philosopher Siddhartha Gautama (later known as “the Buddha”) articulated the “Four Noble Truths.” These insights would form the foundation for the next 40 years of Gautama’s teachings (Goldstein, 2002). The first truth claims that experiencing some amount of suffering is an inevitable part of existence. In the second noble truth, Gautama declared that the primary cause of this suffering is “*tanhā*,” a Pali word commonly translated as “craving”, or “greed” (Davids & Stede, 1921). Three types of craving are articulated: craving for sensual desires, craving for attainment, and craving for avoidance of unpleasant circumstances (Harvey, 2013). The third noble truth then states that the antidote to this human suffering is a mind-state termed “*virāga*,” literally “non-thirst” (Bodhi, 2005; Thanissaro, 2013). *Virāga* can be more generally thought of as “non-clinging” or “nonattachment” (Bodhi, 2005), and is described in the source text as the “remainderless fading away and cessation of that same craving, the giving up and relinquishing of it, freedom from it” (Thanissaro, 2013). In the final Noble Truth, Gautama stated that the way to develop nonattachment is the “eight-fold path,” a set of teachings and practices designed for one purpose: to induce nonattachment.

Essentially, the Buddhist intervention is a cognitive-behavioral one, comprised of wisdom or insight teachings delivered in the form of Dhamma talks (with the advent of written language, the teachings were codified into “suttas”), and behavioral interventions in the form of meditation and other practices. Given the volume of empirical attention directed toward meditation practices, it is somewhat puzzling that Buddhist cognitive interventions have received very little attention. The present investigation focuses on such a cognitive intervention, called the “three marks” of existence.

Similarly, given the academic enthusiasm among for Buddhist-based constructs such as dispositional mindfulness, it is also surprising that very little research has focused on the more central (in Buddhism) mind-state of nonattachment. While nonattachment-related constructs such as “acceptance” or “non-reactivity” have received empirical attention, these constructs focus narrowly on aversive emotions and thoughts, and exclude acceptance toward the vast majority of life experiences. Thus, I see two problems with the current state of Buddhist-based research in these areas. First, research on Buddhist-based interventions has focused almost exclusively on various forms of meditation (its behavioral component), leaving unexamined an immense body of Buddhist wisdom or cognitive-based techniques designed to generate nonattachment. If these cognitive interventions are left unstudied, psychology risks leaving important well-being interventions untapped. Second, given the central goal of Buddhist practice is the development of a mind-state called *virāga* (nonattachment), more research should be focused on this construct. While acceptance-based constructs in the mindfulness literature are similar to nonattachment, they focus narrowly on acceptance of negative emotions or thoughts, leaving the broader nonattachment construct, which encompasses all life experiences (e.g., social rejection, losing one’s job, etc.) relatively unstudied.

The aim of the present study is to examine a cognitive Buddhist intervention known as “the three marks” to determine both the intervention’s potential to promote a nonattached mind-state, as well as the efficacy of this mind-state as a buffer against social stress task. Social stress is emphasized here because Gautama believed that attachment to the way in which others perceive us is a particularly potent cause of human distress (Harvey, 2013). This view is supported by stress research as well (Dickerson & Kemeny, 2004; Miller, Chen, & Cole, 2009).

Background on Nonattachment

Nonattachment (N-A) is a state of mind characterized by a lack of *obsession* with the various emotional, interpersonal, or general events of one's life (Bodhi, 2005; Sahdra, Shaver, & Brown, 2010). Importantly, N-A is not a form of apathy – this is a common misconception. Rather, individuals who have cultivated nonattachment to high degree continue to take joy in pleasant experiences, and strive for important goals. However, when these joyous experiences inevitably end, unpleasant experiences begin, or impediments to one's goals arise, the non-attached individual understands these changes are unavoidable and so remains at peace with reality as it is (Goldstein, 2002). In contrast to apathy, N-A is said to give rise to a sort of fearlessness, and this fearlessness can then allow for a freer, less inhibited, and more enthusiastic existence (Bodhi, 2005).

Nonattachment can be thought of as a fundamentally altered set of goals or expectations for one's life experiences (Goldstein, 2002). For example, if one is attached to social status, then it would necessarily be an important goal to maintain this status. Given this, theories of emotion generation and regulation offer some perspective on how N-A might lead to decreased suffering and distress. For instance, appraisal-based emotion generation theories suggest that emotion is elicited when perceptions are in conflict with currently active goals or expectations (Ellsworth & Scherer, 2003; Gross, 2015). From this perspective, N-A may provide significant resilience through its association with more flexible and realistic goals, resulting in fewer experiences being in conflict with current goals. Further, if one imagines a deep nonattachment to all life's difficulties, large and small, Gautama's claim of nonattachment leading to the removal of all suffering seems more conceivable (Desbordes et al., 2015).

N-A may also improve quality of life by reducing the time-course of experienced negative emotions (Desbordes et al., 2015). For instance, if one is unattached to one's emotional state, the experience of anxiety may be accompanied by a less reactive and more accepting response. This may in turn lead to less rumination and monitoring of one's emotional state, followed by a subsequent decrease in the anxiety's salience over time (Wegner, Schneider, Carter, & White, 1987). In Buddhist psychology, this process is called "the two darts of painful feeling" (Bodhi, 2005). In this parable, the practitioner is first struck by a dart, resulting in painful feelings. Next, the additional frustration and aversion caused by non-acceptance of the pain of the original dart represents a second dart of painful feeling, which exacerbates the pain (Bodhi, 2005).

Existing Dispositional Research

Existing questionnaires measure various forms of "acceptance", a mind-state related to N-A. Acceptance is generally characterized by an openness or acceptance of *internal* experiences such as negative emotions and thoughts (Herbert & Forman, 2011). Acceptance and N-A are similar in that, in Buddhist theory, acceptance of things as they are is considered to be the *primary* benefit of the N-A mind-state (Bodhi, 2005). Acceptance (generally as a subscale) has been investigated in several domains such as (a) mindfulness research (e.g., the KIMS: Baer, Smith, & Allen, 2004), (b) experiential avoidance research (AAQ-II: Bond et al., 2011), and (c) emotion regulation research (e.g., DERS: Gratz & Roemer, 2004).

Research employing these constructs as individual differences is promising, and suggests that accepting dispositions may provide emotional resilience to a broad array of aversive experiences such as traumatic events (Tull, Barrett, McMillan, & Roemer, 2007; Tull, Gratz, Salters, & Roemer, 2004) addictive craving (Heppner et al., 2015), low self-esteem (Michalak,

Teismann, Heidenreich, Ströhle & Vocks, 2011), and negative feedback (Teper & Inzlicht, 2014). For example, the acceptance subscale of the KIMS has been found to mediate the relationship between low self-esteem and depression (Michalak et al., 2011).

Although existing acceptance research is promising, the constructs' focus on aversive emotions and thoughts leave the majority of life events (e.g., loss of social status, the ending of an important relationship, failing health) unaddressed by the accepting mind-state. In contrast to this, N-A emphasizes openness to all life experiences, including the potentially aversive events themselves. From the perspective of appraisal theories of emotion generation discussed above, this emphasis of N-A including all life events could potentially allow the mind-state to reduce emotion severity much earlier in the emotion-generation process, and to greater effect.

While empirical research on N-A is scarce, recent work to develop a Nonattachment Scale (NAS) is one promising exception (Sahdra et al., 2010). The scale addresses N-A from a dispositional perspective, based on Buddhist theory. For instance, the scale is broad reaching, mirroring a teaching called the "Eight Vicissitudes." In this teaching, Gautama named four categories of life experiences that one should develop N-A toward: pleasure and pain (including emotional experiences), gain and loss, praise and blame, and fame and ill-repute (Bodhi, 2005). The Buddha claimed that if N-A were fully developed toward these four types of experience, all suffering could be eliminated (Thanissaro, 2010). The NAS targets this broad range of experience with items assessing reactivity toward negative emotion or pain (e.g. "I can remain open to thoughts and feelings that come into my mind, even if they are negative or painful"), loss of social relationships (e.g., "I do not have to hang on to the people I love at all costs; I can let them go if they wish to go"), and generic events (e.g., "I do not get "hung up" on wanting an "ideal" or "perfect" life").

Higher NAS scores have been associated with increased levels of life satisfaction, positive affect, self-acceptance, positive relationships, and prosocial behavior (Lamis & Dvorak, 2013; Sahdra et al., 2010; Sahdra, Ciarrochi, Parker, Marshall, & Heaven, 2015; Wang, Wong, & Yeh, 2015). NAS scores also predict lower suicide rumination, depressive symptoms, and neuroticism (Lamis & Dvorak, 2013; Sahdra et al., 2010; Tran et al., 2014).

While dispositional N-A research is important, it has some limitations. Chiefly, it is difficult to isolate and study N-A with such as scale because any such dispositional measure is necessarily confounded with a great many unwanted covariates (e.g., well-being, neuroticism, etc.). To isolate nonattachment and learn more about the mind-state and its benefits, experimental research inducing N-A is required.

Experimental N-A Research

To my knowledge, there is no existing N-A induction research. However, some experimental work has focused on emotional acceptance. The majority of acceptance inductions, however, have simply instructed participants to remain open to and accept negative emotions while resisting the urge to turn away from these experiences (Campbell-Sills, Barlow, Brown, & Hofmann, 2006). Studies using such instructions have reported mixed results. On one hand, acceptance inductions have been associated with reduced negative emotion after, but not during, aversive films (Campbell-Sills et al., 2006), and acceptance may decrease intrusive thought frequency over the long term, but not the short term (Marcks & Woods, 2003). On the other hand, some researchers have failed to find benefits for emotional acceptance, including in the context of a CO₂ inhalation stressor (Feldner, Zvolensky, Eifert, & Spira, 2003), and a stressful writing task (Low, Stanton, & Bower, 2008).

As previously stated, Buddhist teachings place special emphasis on socially-oriented stressors, indicating that elements such as social status are particularly susceptible to attachment (Thanissaro, 2010). Several experimental studies have investigated the possibility that acceptance may buffer against social stress. However, this research has resulted in inconsistent findings as well. Hofmann et al. (2009) report that emotional acceptance instructions failed to reduce speech anxiety compared to suppression instructions. Similar findings were reported by Helbig-Lang, Rusch, Rief, and Lincoln (2015). The acceptance instructions used in these studies are quite short, focus on acceptance of emotions, and simply ask participants to be accepting of their negative emotions. For example, Hofmann et al. (2009) used the following acceptance instructions:

Please try to experience your feelings fully and do not try to control or change them in any way. Nevertheless, please let your feelings run their natural course and allow yourself to stay with your emotions, as fully as possible, without trying to control your feelings in any way. You will receive a list of speech topics in a few minutes. For now, please sit quietly with your eyes closed for one minute. During this time please handle your feelings in the manner I suggested. I will inform you when the one minute has expired.

Training procedures of this type have two major problems. First, they do not direct acceptance towards the aversive outcomes themselves (i.e. loss of social status), and focus on accepting negative emotions caused by these outcomes. As a consequence, these instructions do not address a core cause of social distress, which research suggests is an anticipated loss of social connection or status (Miller et al., 2009). Similarly, from the perspective of the process model of emotion generation (Gross, 2015), social evaluation within a speech task generates anxiety in

part because social evaluation represents a threat to participants' active goals of maintaining a positive social standing. It can be seen that emotional acceptance inductions of this type do not alter social status goals/expectations, and so may lack efficacy. If, however, participants have been trained to be more socially non-attached and thus accepting of the inevitable "blame" or "ill-repute" inherent to life, this may result in more flexible goals or expectations, and this flexibility could, in turn, render negative social evaluations more tolerable, thereby reducing anxious reactivity to anticipated social evaluation.

A second problem with this research is that emotional acceptance inductions currently used in the literature do not attempt to alter participants' beliefs about the efficacy of accepting the aversive negative emotions, and instead simply instruct them to be accepting. It is reasonable to suspect that if participants believe an accepting attitude will benefit them, then the attitude might be more impactful for stress reduction.

The Present Study

The present research extends existing acceptance work by focusing on N-A, which incorporates acceptance mind-states directed toward a broader array of life events such as the loss of social status. Additionally, this study seeks to expand Buddhist-based research by inducing N-A using a common cognitive training technique known as "the three marks" or the "the three characteristics".

Buddhist texts are explicit regarding how exactly one might go about developing a nonattached mind-state. They prescribe a mix of behavioral interventions (i.e., meditation) as well as numerous verbal wisdom teachings designed to be passed from teacher to student (a written language had not yet been developed at the time of the Buddha; Harvey, 2013). One of the most common teachings designed to induce nonattachment is called the "three marks of

existence” (Bodhi, 2005; Easwaran, 1987). The three marks represent core insights into the nature of reality that, when understood completely, end suffering through the development of N-A (Bodhi, 2005). They are: (1) the inevitability of experiencing aversive life circumstance (*dukkha*), (2) the interdependent and self-less nature of reality, also called “non-self” (*anattā*), and (3) the impermanent, or essential unreliability of all phenomena (*anicca*; Bodhi, 2005). Taken together, if all life experiences are constantly changing and unreliable, are determined by many forces outside of our control, and so will inevitably displease us, it is wise to learn to “let go” of the pervasive human attachment to life experiences being as we want them to be (Goldstein, 2002).

To test the stress-reductive efficacy of a nonattached mind-state developed via the “three marks”, an anticipated public speaking task was employed. This task deceived participants and informed them that they each had been selected to give a persuasive speech to a panel of judges comprised of their fellow participants and a research assistant. The N-A induction discussed each “mark” in terms of social evaluation and negative emotion, with the aim of increasing people’s nonattachment toward the “judges” opinions of them, as well as the experience of negative emotion and anxiety that would necessarily accompany such a task. The induction was modeled on the teachings of Joseph Goldstein (e.g., Goldstein, 2002). To account for possible demand characteristics and/or placebo effects, half of the participants received a placebo public speaking training. This training ostensibly provided useful information about impromptu public speaking.

Hypotheses. First, the N-A induction was expected to increase participants’ N-A levels (relative to the placebo condition), as measured by agreement with future-oriented statements adapted from the dispositional nonattachment scale. Second, stress research on cognitive or psychological causes of stress reactivity suggests that a primary determinant of the magnitude of

the physiological stress response is the extent to which people cognitively appraise the impending event as “threatening” or “challenging” (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Thus, a core benefit of the N-A induction should be a reduction in threat appraisal of the speech task, relative to the placebo condition. Third, in terms of anxious reactivity to the speech stressor, the N-A induction was expected to mitigate anxiety reactivity assessed in the moments prior to the speech task, as well as speed recovery after a brief resting period.

Lastly, it has been reported that acceptance-based trainings have been more effective for people low in trait acceptance (Feldner et al., 2003). Given the similarities between acceptance and nonattachment, those in the N-A condition are expected to report greater benefits of induction in terms of threat appraisal. Similarly, nonattachment should reduce anxious reactivity and speed recovery from the speech stressor to a greater extent among people reporting low levels of dispositional nonattachment.

METHOD

Participants and Procedure Overview

G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a sample size of 176 would be required to obtain .95 power to detect the expected medium effect size ($d = .5$) with respect to the between-subjects design. To obtain such a sample, the present experiment was scheduled to run for 2 weeks, with twenty 1-hour timeslots each week. Initially, the sample consisted of 203 undergraduate students from North Dakota State University, who were compensated with course credit and recruited via “SONA” participant registration software. The study was called the “Behavior and Persuasion Study”.

In brief, all participants were deceived and told they would be giving a speech to several experimenters as well as their fellow participants. To mitigate potential problems with excessive stress reactivity, participants were repeatedly informed that if they were too uncomfortable, they would be allowed to leave the study with partial credit. Fourteen people asked to leave before completing the experiment. An additional 8 participants were dropped for failing catch trials, and 2 were dropped due to duplicate subject numbers. Thus, the final dataset included 177 participants (57.7% women, M age = 18.9 $SD = 2.29$, 88.0% Caucasian).

Participants arrived to the laboratory in groups of 1-6 ($M = 5.37$, $SD = 1.06$). The lab space consisted of a large central room surrounded by 6 private computer rooms with doors. The central space included a podium with a microphone, faced by a row of 7 chairs for the “judges”. A tripod with a video camera and microphone was positioned behind the judges’ chairs.

The experiment included an initial baseline stress and personality assessment phase, followed by either a placebo or N-A Induction, an anticipatory stress and speech preparation phase, and a peak stress assessment. Following the peak assessment, participants were informed

that there was a problem with our equipment and they did not have to give a speech. This announcement was followed by a brief recovery period, a recovery stress assessment, and finally an individual debriefing.

Study Procedures

Baseline phase. Upon arrival, participants were directed to a row of chairs facing a podium, and given a clipboard with an initial informed consent document. This form referenced the baseline anxiety and personality self-report scales only; the form did not mention public speaking. This was necessary to obtain baseline self-reports that were uncontaminated by participants' anxiety about a possible future speaking task. After indicating initial consent, participants were sent to private rooms where they used Medialab software to complete three baseline computerized questionnaires: the Spielberger State Anxiety Scale-Short Form (STAI-S: Marteau & Bekker, 1992), the Implicit Positive and Negative Affect Test (IPANAT: Quirin, Kazén, & Kuhl, 2009), and the willingness to Speak baseline assessment (Robinson lab). Following this assessment, participants then completed the Non-Attachment Scale (NAS; Sahdra et al. 2010). After completing these instruments, participants were told by the computer to return to the central lab area.

After all participants had returned to the central area, the experimenter then explained the study's purported aim. Participants were deceived and told that one of them would be chosen to give a speech to the rest of the group in order for the researchers to study "persuasion".

"This portion of the study is about how people judge persuasive speaking and why. To accomplish this, one participant will be selected at random from the full experiment group to be a speaker, and the rest of you will be judges. There will also be a group of previously trained judges who will enter later in the session,

just before the speech is about to start. Thus, there will be at least 5 judges in total. Again, you will either be selected as the speaker or a judge. The speaker will receive a 12-minute training on public speaking and sufficient time to prepare a speech. Participants selected to be judges will receive a 12-minute training on how to judge effective public speaking. The speaker will then present a short speech they have prepared, and the judges will rate the effectiveness of this speech. Please sign the consent form if you agree to participate. Importantly, this form states that your participation in this experiment is fully voluntary. If at any time during the experiment you are unable or unwilling to continue, you should inform a research assistant and you will be allowed to leave.”

After signing a second informed consent referencing potential public speaking, participants were sent back to private rooms. The experimenter then went to each room and started the speech stress induction program (using E-prime 2.3). E-prime subsequently deceived participants and informed *all* of them that they had been the one person selected to give a 10-minute video-recorded speech to the rest of the group. The computer instructions explained that the judges/audience would include the experimenter, the subject’s fellow participants, and a group of trained judges who would enter later. This message about additional trained judges was included because participants were recruited in groups of 1-6, meaning that it was possible that very few participants, or “judges” would be present on some occasions, potentially reducing the effectiveness of the speech stress induction. However, in practice, these concerns were not a problem, as the mean group size was quite high ($M = 5.36$, $SD = 1.05$). Participants were then told that before preparing their speech, they would receive a 12-minute training designed to help them do their best on the speech.

Placebo Induction. Following Hayes et al. (1999), a placebo induction was administered to half the participants using random assignment by subject number. A placebo induction was employed to account for possible demand effects of the nonattachment training on self-reported dependent variables. The placebo induction was a “helpful speech hints” training designed to appear helpful, while not actually providing useful information. The training took about 12 minutes and consisted of approximately 800 words outlining innocuous speaking tips such as the usefulness of thinking ahead about what one is going to say, or the fact that one’s speech might have several themes and subthemes (see Appendix A & B for transcripts of the trainings). The placebo training was presented as text on the computer screen, with an audio recording reading the text in tandem with the words on the screen. The audio was recorded using Waveasaur 1.2 freeware sound editor.

Non-attachment induction. The induction of non-attachment should, like the construct itself, be firmly rooted in Buddhist psychological theory. To induce nonattachment by cognitive means, the Buddha’s “three marks of existence” teaching was used. In terms of the induction of social and emotional N-A for this experiment, I adapted teaching concepts used by Goldstein (2002) to address socially-driven stress. The potential negative evaluations by others (and associated fear and anxiety) that occur when giving a speech were framed as an inevitable part of life (*dukkha*). Similarly, these phenomena were framed as constantly in flux. For instance, one could be criticized in one moment and praised in the next, and in this way these experiences are quite temporary (*anicca*). Lastly, one cannot simply decide to feel less anxious or give a perfect speech and make everyone happy. This is the case because these outcomes are dependent on many factors out of our control (*annatā*). The N-A induction argued that if some negative evaluations by others are inevitable, impossible to fully control, and are quite temporary from

one day to the next, it may be wise to be less attached to needing everyone to like us, or judge us favorably. Similarly, the induction argued that if unpleasant emotional experiences during the speech preparation and speech itself are predominantly outside of the participant's immediate control, temporary, and are an inevitable part of the experiment, it may be wise to be less attached and more open to how one might be feeling.

Subsequent to whatever training the participants received, people answered a series of questions designed to reinforce the information they had heard (See Appendix A and B for specific questions). To control for possible differences in demand characteristics between the N-A and placebo conditions, demand checks were assessed directly following the inductions (Hayes et al., 2009). These questions asked participants how “useful” and “valuable” they found the information they received.

Stress induction phase. Other than the training, all procedures were identical for all participants. Following the training, the experimenter personally provided each participant with a pad of paper and pen while explaining that they had been selected to speak in about 15 minutes. If participants asked questions, they were told “all the information I can give you is provided by the computer. This is necessary to standardize results and minimize data contamination”. The experimenter then started the Medialab questionnaire program and a time-stamped video recording of the participant.

Participants were then informed by the computer that they would have an initial 10 minutes to prepare a 10-minute speech on “racism in America”, a controversial topic intended to produce maximum speech anxiety (Helbig-Lang et al., 2015). Participants were encouraged to prepare notes, but were told that they could not use their notes during the speech (a procedure intended to increase anxiety). Following this instruction, Medialab displayed a countdown timer

on the computer screen descending from “10” to “0” minutes. When the timer reached zero, the computer informed participants via an audio message and an on-screen message that they must complete a brief questionnaire before being given a final 5 minutes to prepare their speech.

Peak stress phase. Following speech preparation, participants used Medialab to complete the PASA threat-appraisal scale, as well as the STAI state anxiety self-report, IPANAT implicit state affect, and a willingness to Speak assessment. These measures are described below. Video recordings of the final 2 minutes of speech preparation were also coded by trained research assistants for behavioral anxiety. After assessing the peak measures, the program then paused and waited for the experimenter to return. After allowing sufficient time for the completion of the peak measures, the experimenter went to each room, apologized profusely, and informed participants that the camera equipment used to record and analyze the speech was not operating properly. For this reason, there was unfortunately no reason to continue with the experiment. People were told the experiment would conclude after they completed a final set of questionnaires.

Recovery phase. Next, a message appeared on the computer screen that asked participants to relax for 3 minutes (Hoffman et al., 2009), after which the STAI, IPANAT, and willingness to Return were again assessed. Lastly, a modified version the NAS was administered to assess the efficacy of the N-A Induction. Manipulation checks also assessed the believability of the speech deception, and the participant’s effort in using the Induction for speech preparation (Helbig-Lang et al., 2015).

Group debrief phase. With the group as a whole, the experimenter then read a script explaining the true hypothesis and the need for deception in the study. The experimenter

requested that participants refrain from discussing the experiment with others in order to avoid future data contamination.

Personality Measure

Nonattachment Scale (NAS). See Appendix C for the full version of this and all measures used in this study. On the 30-item NAS (Cronbach $\alpha = .92$), respondents rated the extent to which they agreed (1 = “strongly disagree”, 6 = “strongly agree”) with statements focused on an array of common experiences or events. Items address emotional/affective experiences (e.g., “I can let go of feelings of dissatisfaction about the past), social events (e.g., “I can admit my shortcomings without shame and embarrassment”), statements about the self (e.g., “I accept my flaws”) and generic statements about life experiences (e.g., “I do not get ‘hung up’ on wanting an ideal or perfect life”). High scores are consistent with greater tendencies to live one’s life in a nonattached mind state.

Dependent Measures

Nonattachment beliefs. To probe whether the nonattachment training enhanced social and emotional nonattachment as intended, a questionnaire was developed based on the NAS. In the recovery phase, participants were asked to report their agreement (1= “strongly disagree”, 9= “strongly agree”) with 6 statements assessing attitudes towards nonattachment concepts discussed in the training (e.g., “it is wise to accept the negative feelings and events that sometimes occur in life”). In the present sample, the scale correlated positively with the NAS ($r = .40, p < .001$) and showed acceptable internal consistency ($\alpha = .64$).

Threat appraisal. Stress generation theories, as well as emotion generation theories, posit that appraisal of a given stimulus as threatening or problematic is a fundamental antecedent of stress and negative emotion generation (Gaab, Rohleder, Nater, & Ehlert, 2005; Gross, 1998).

To measure threat appraisals of the present speech task, I administered the primary Appraisal scale of the primary and Secondary Appraisal (PASA; Gaab et al., 2005) during the peak stress phase. The measure asked respondents to quantify their agreement (1 = strongly agree, 6 = strongly disagree) with 8 statements referring to the impending speech task (e.g., “I do not feel threatened by the speech task”, “the speech task is not a challenge for me”). The primary Appraisal scale exhibited moderate internal consistency in the present sample ($\alpha = .74$).

Spielberger State-Trait Anxiety Inventory- Short Form (STAI-S). State anxiety levels were measured in baseline, peak, and recovery phases using Marteau and Bekker’s (1992) 6-item STAI-S. Participants reported the extent to which (1 = not at all, 4 = very much) they currently felt “calm”, “tense”, “upset”, “relaxed”, “content”, and “worried”. Marteau et al. (1992) reported that the STAI-S correlated strongly with its longer parent scale (the STAI: $r = .90$), and also exhibited strong indicators of reliability and validity. In the present sample, the scale showed adequate internal consistency in each phase (baseline $\alpha = .76$; peak $\alpha = .85$; recovery $\alpha = .83$).

Implicit Positive and Negative Affect Test (IPANAT). State negative affect levels were measured implicitly at baseline, peak, and recovery phases using a modified version of Quirin, Kazén, and Kuhl’s (2009) IPANAT. Participants were asked to report the extent to which 6 random word strings (e.g., safme, vipen) “fit” (1 = doesn’t fit at all, 4 = fits very well) with each of 3 negative emotion words (tense, helpless, inhibited). The extent to which participants felt that the feeling words fit with the artificial words is a marker of state negative affect (Quirin et al., 2009). The IPANAT has demonstrated strong psychometrics: the measure shows convergent validity in the form of moderate correlations with explicit reports of negative affect, $r = 0.33$, $p < .001$, internal consistency (e.g., alphas consistently near .80), and criterion validity (Quirin et al.,

2009). In the present sample, the IPANAT displayed strong reliability (baseline $\alpha = .90$; peak $\alpha = .92$; recovery $\alpha = .89$).

Willingness to speak, baseline phase (Robinson lab). Following Eifert and Heffner (2003), avoidance of the public speaking task was measured using a single item in each measurement phase. At baseline, participants were told by the computer that “one participant will be asked to give a 10-minute speech for this experiment. Please rate the extent to which you wish to give a speech”. Participants indicated their preferences via keyboard (1 = I extremely prefer not to speak, 9 = I am extremely willing to speak). To maintain deception, this avoidance measure differed across baseline, peak, and recovery time-points. Research suggests that such a measure is capable of capturing the beneficial effects of an acceptance induction similar to the present one (Eifert & Heffner, 2003).

Willingness to speak, peak stress phase (Robinson lab). During the peak anxiety assessment phase, participants were first reminded that participation in the experiment was voluntary, and that they could exit the experiment (receiving partial credit) if they were unable to continue. One item assessed the extent to which participants were willing to proceed with the experiment: “please rate the extent to which you feel comfortable with giving your speech today” (1 = I am not at all willing to proceed with the experiment, 9 = I am extremely willing to proceed).

Willingness to return, recovery phase (Robinson lab). Following the cancelation of the speech task and a three-minute recovery phase, participants were informed that we would like to reschedule the experiment at another time (when the necessary video equipment is working properly). Participants were asked to rate the extent to which (1 = extremely willing to reschedule the speech, 9 = extremely unwilling to reschedule the speech) they were willing to

reschedule their speech: “Whether you were a judge or a speaker, we will continue to need participants for future studies similar to this one. Please rate how willing you are to participate in a second public speaking/judging experiment”.

Video anxiety coding scheme. Using a coding scheme based on Egloff and Schmukle (2002), 2-minute video clips were coded by trained judges. These videos showed the subjects above the waist after they had completed peak stress measures and were waiting to be called to present their speech. The videos were captured using Microsoft HD Life Cam webcams positioned on top of each computer monitor (the subjects were aware that they were being recorded). Judges were trained by watching videos as a group and discussing behavior related to each judgment type they would make. Coder training was completed when the group consistently converged within 1 rating point within each category for a sample video. There were 3 behavioral anxiety ratings and 2 subjective anxiety ratings. Behavioral anxiety categories comprised the extent to which (0 = not at all, 4 = almost the entire time) participants exhibited: 1) nervous gestures such as self-stimulation of the face or neck, or self-stimulation of the body (e.g., rubbing one’s arm), 2) awkward or immobile body posture such as a notably rigid upper body, and 3) nervous mouth movements such as biting or licking lips or twitches of the mouth.

After completing the behavioral measures, raters made 2 subjective ratings: 1) “taken together, how much anxiety did the person seem to be feeling (0 = not at all anxious, 4 = extremely anxious), and 2) “taken all together, how tense did the person seem” (0 = not at all tense, 4 = extremely tense). The 5 categories were then averaged into a single Video Anxiety measure which showed adequate internal consistency ($\alpha = .75$).

Other Measures

Training value. To the extent that people perceived the training they received to be valuable and useful, the two conditions could generate differing demand effects on self-reported dependent variables (Hayes et al., 1999), which in turn could favor the nonattachment condition for reasons other than the content of the manipulation. Therefore, following Hayes et al. (1999), a 2-item demand check was administered. Participants were asked to rate the extent to which the training they received seemed useful (1 = not at all useful, 9 = extremely useful) as well as valuable (1 = not at all valuable, 9 = extremely valuable) for the upcoming speech. For simplicity, these measures were averaged ($\alpha = .79$).

Training use. To aid in the interpretation of the current findings, it was anticipated that the extent to which participants paid attention to and used the inductions would be of interest. During the recovery phase, participants were asked to report their agreement (1 = strongly disagree, 6 = strongly agree) with the statement “I paid attention to the training and tried to use the information during my speech preparation time”.

Training helpfulness. The extent to which people thought the trainings were helpful in reducing their speech anxiety was also of interest. In the recovery phase, participants indicated their agreement (1 = strongly disagree, 6 = strongly agree) with 3 statements concerning how helpful the training had been in reducing their anxiety (e.g., “The training was helpful in reducing my anxiety”). The items showed adequate internal reliability ($\alpha = .78$), and converged with tendency to report training use ($r = .31, p < .001$). The measure also demonstrated convergent and discriminant validity with peak stress indicators: primary appraisal, $r = -.37, p < .001$; STAI-S: $r = -.42, p < .001$; and willingness to speak, $r = .41, p < .001$).

RESULTS

Initial Analyses

Training value. To test for potentially significant differences in demand effects between the placebo and nonattachment conditions, a between-subjects ANOVA was performed, in which I examined whether Induction Condition affected perceptions of training value. This and all other analyses were performed using SAS 9.4 software. In support of the efficacy of the current procedures, participants perceived similar value in the placebo ($M = 3.31$, $SD = 1.02$), and nonattachment ($M = 3.36$, $SD = 1.01$) conditions, $F(1, 166) = .10$, $p = .751$.

Correlations among peak variables. A primary hypothesis was that a nonattachment training focusing on the “three marks” would reduce anxious reactivity to an anticipated speech task. To measure reactivity in multiple ways, 4 stress-related measures were assessed immediately prior to giving one’s speech: 1) appraisals of the speech task as threatening (PASA-primary), 2) self-reported state anxiety (peak STAI-S), 3) implicit negative affect (peak IPANAT), and 4) willingness to give one’s speech (peak willingness). These measures showed acceptable convergent validity, as self-reported levels of anxiety were significantly correlated with appraisals of threat ($r = .60$, $p < .001$), implicit negative affect levels at peak ($r = .30$, $p < .001$), and willingness to give one’s speech ($r = -.69$, $p < .001$).

Video coding. Preliminary analyses indicated that observers often had different perceptions of displayed anxiety. The measure also failed to converge with other peak stress measures: primary appraisal ($r = .08$, $p = .282$), peak STAI ($r = .08$, $p = .306$), peak IPANAT ($r = -.06$, $p = .432$), and peak willingness ($r = -.09$, $p = .236$). Given these questions about this measure, I elected to omit it from further analyses.

Nonattachment Beliefs

A central interest in this study was whether nonattachment could be enhanced via a cognitive induction. To test for such alterations in nonattachment beliefs, a one-way ANOVA was performed, with nonattachment beliefs as the dependent measure. As hypothesized, participants in the nonattachment condition reported greater agreement with nonattachment concepts ($M = 4.58, SD = .70$) than did those in the placebo condition ($M = 4.32, SD = .69$), and inferential statistics confirmed that this difference was significant, $F(1, 174) = 7.06, p = .008, \eta_p^2 = .04$. Although this was not a particularly strong effect, it is important to consider that the concepts in question are basic beliefs about the world and the human experience. From this perspective, the fact that a 12-minute training induction worked is noteworthy.

This finding was encouraging, and I proceeded to test whether these nonattachment beliefs were indeed protective against the present stress task. Results suggest that they were, with nonattachment beliefs being significantly related to markers of reduced stress reactivity (PASA threat, $r = -.25, p < .001$; STAI, $r = -.27, p < .001$; IPAN-Neg $r = -.29, p < .001$; peak willingness, $r = .37, p < .001$). Additionally, similar results were found for recovery indices (STAI, $r = -.18, p = .022$; IPAN-Neg $r = -.24, p = .001$; willingness to return, $r = .36, p < .001$). These data suggest that nonattachment mindsets are important for stress reactivity and quality of life.

Threat Appraisal

As hypothesized, a one-way between-subjects ANOVA predicting primary appraisal from Induction Condition indicated that, in the present sample, differences in threat appraisal between the nonattachment group ($M = 3.88, SD = .70$) and the placebo group ($M = 4.58, SD = .70$) were sufficiently large as to suggest hypothetical differences at the population level, $F(1,$

169) = 9.13, $p = .003$, $\eta_p^2 = .05$. Given the ubiquity of social stressors in daily life, this finding supports the efficacy of the present nonattachment induction for lessened stress reactivity and improved quality of life.

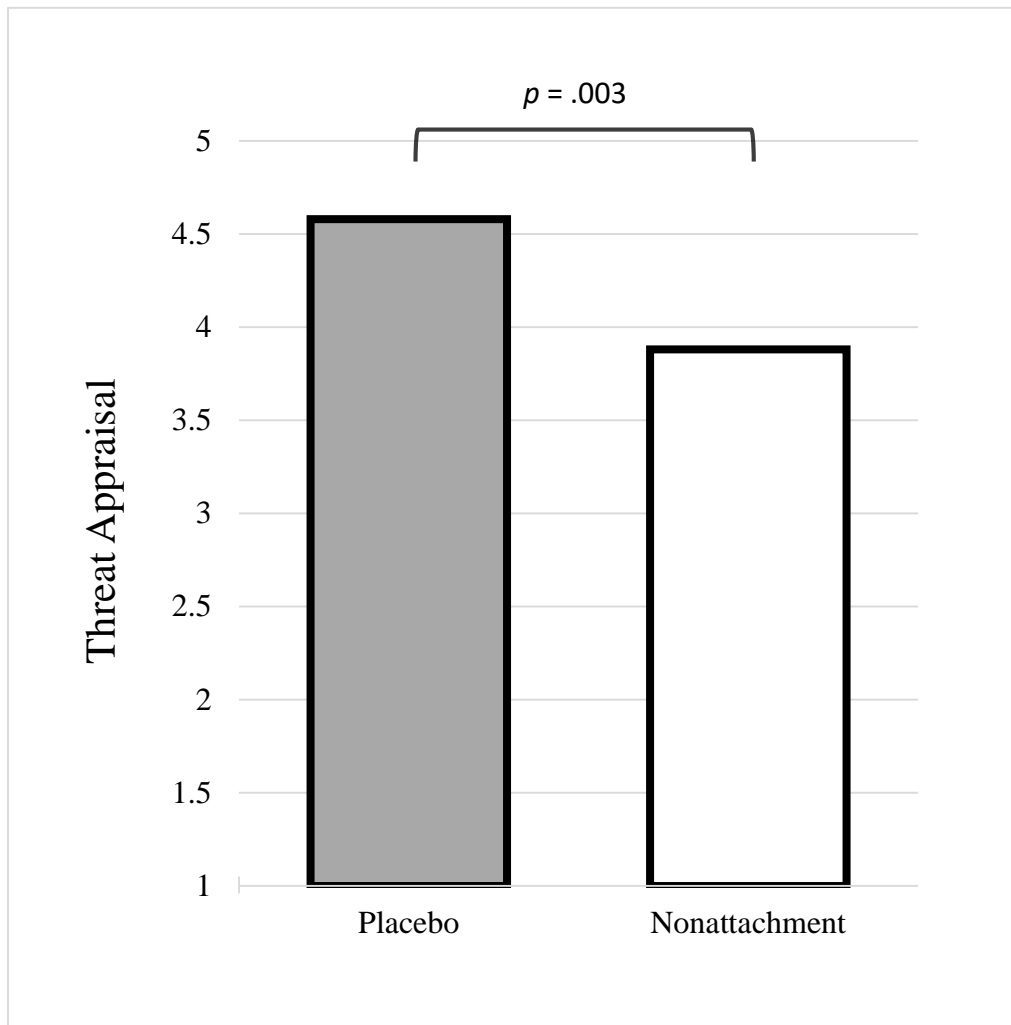


Figure 1. Primary Appraisal as a Function of Induction Condition

Gender effects. To examine the possibility of gender differences, I ran a 2 by 2 ANOVA, adding sex as an additional factor. There was a main effect for Gender, $F(1, 169) = 7.88$, $p = .006$, $\eta_p^2 = .05$, such that women were more threatened by the speech ($M = 4.22$, $SD = .82$) than men ($M = 3.88$, $SD = .83$). This result is consistent with other results in that women often tend to

report greater social anxiety (Caballo et al., 2014). Additionally, there was an interaction, $F(1, 169) = 7.43, p = .007, \eta_p^2 = .04$. Mean differences suggested that although the nonattachment induction was not helpful in reducing men's threat appraisals ($M_{nonattach} = 3.88, M_{placebo} = 3.89$), $F(1, 71) = .01, p = .937$, women benefitted from the induction ($M_{nonattach} = 3.88, M_{placebo} = 4.57$), $F(1, 98) = 20.41, p < .001, \eta_p^2 = .17$.

Trait nonattachment effects. The nonattachment induction was also expected to be particularly effective among those who reported less dispositional nonattachment (NAS). To test for this moderation effect, a general linear model (GLM) was conducted. In this GLM, Induction Condition remained a between-subjects factor, and NAS was a continuous personality-related predictor (Robinson, 2007). There was a main effect for NAS. Expressed as a regression-based predictor, people with high NAS scores were less threatened, $t = -2.63, b = -.25, p = .009$. Additionally, this model indicated the expected (though marginal) Induction by NAS interaction, $F(1, 163) = 3.36, p = .069, \eta_p^2 = .02$.

To better understand the Induction by NAS interaction, a median split was performed to separate participants into high and low NAS groups. As hypothesized, the nonattachment induction tended to be helpful for those below the median with respect to their NAS levels ($M_{placebo} = 4.42, M_{nonattach} = 3.96$), $F(1, 81) = 8.12, p = .006, \eta_p^2 = .09$. By contrast, the induction did not alleviate threat perceptions among people with high NAS scores ($M_{placebo} = 4.09, M_{nonattach} = 3.85$), $F(1, 82) = 2.07, p = .154$.

State Anxiety

In general terms, I expected anxiety to increase from baseline levels in the moments immediately before the speech, and that anxiety levels would then drop in the recovery phase. I also hypothesized that peak anxious reactivity would be less pronounced in the nonattachment

induction condition, and that recovery would be more pronounced. To examine these effects, I ran an initial 2 (Induction Condition) by 3 (Time) ANOVA. In this analysis, there was the expected main effect for Time, $F(2, 334) = 162.34, p < .001, \eta_p^2 = .49$, with people reporting greater state anxiety at peak ($M = 2.92, SD = .68$) than at baseline ($M = 1.77, SD = .52$), $F(1, 167) = 227.88, p < .001, \eta_p^2 = .58$. And, state anxiety dropped from peak to recovery ($M = 1.88, SD = .6$), $F(1, 170) = 390.30, p < .001, \eta_p^2 = .69$. A final comparison revealed that people were still somewhat anxious at recovery, relative to baseline, $F(1, 167) = 3.3, p = .071, \eta_p^2 = .02$. In the initial ANOVA, however, there was no main effect for Induction Condition, $F(1, 167) = .13, p = .721$, and the expected Time by Induction interaction was also not present, $F(2, 334) = .39, p = .674$. This result suggests that the nonattachment training did not directly alter anxiety reactivity or recovery as hypothesized.

Gender effects. Given the primary appraisal findings, it was reasonable to expect that there would be gender differences in the effects of the induction on anxiety reactivity and recovery. To examine effects of this type, I reran the normative ANOVA with Gender as an additional factor. Because the normative models are discussed above, in this section I will only report effects that involve gender. The ANOVA revealed a marginal main effect for Gender, $F(2, 167) = 3.65, p = .058$, such that women were generally more anxious ($M = 2.25$) than men ($M = 2.11$). The Induction by Gender interaction was not significant, $F(1, 165) = .74, p = .390$. However, the Time by Gender interaction reached significance, $F(2, 330) = 5.72, p = .004, \eta_p^2 = .03$, and was further qualified by a significant Induction by Time by Gender interaction, $F(2, 330) = 3.22, p = .041, \eta_p^2 = .02$.

To understand this 3-way interaction, I ran induction by gender ANOVAs for each time point separately. The effects of the induction interacted with gender during the peak phase, $F(1,$

171) = 3.82, $p = .052$, $\eta_p^2 = .02$, but no similar interactions occurred at baseline, $F(1, 165) = .06$, $p = .809$, or at recovery, $F(1, 171) = .19$, $p = .660$. Means revealed that, at peak, training condition did not alleviate anxiety for men ($M_{\text{placebo}} = 2.7$, $M_{\text{nonattach}} = 2.87$), $F(1, 72) = 1.12$, $p = .270$, but decreased anxiety for women ($M_{\text{placebo}} = 3.15$, $M_{\text{nonattach}} = 2.92$), $F(1, 99) = 2.91$, $p = .091$, $\eta_p^2 = .03$ (See Figure 2).

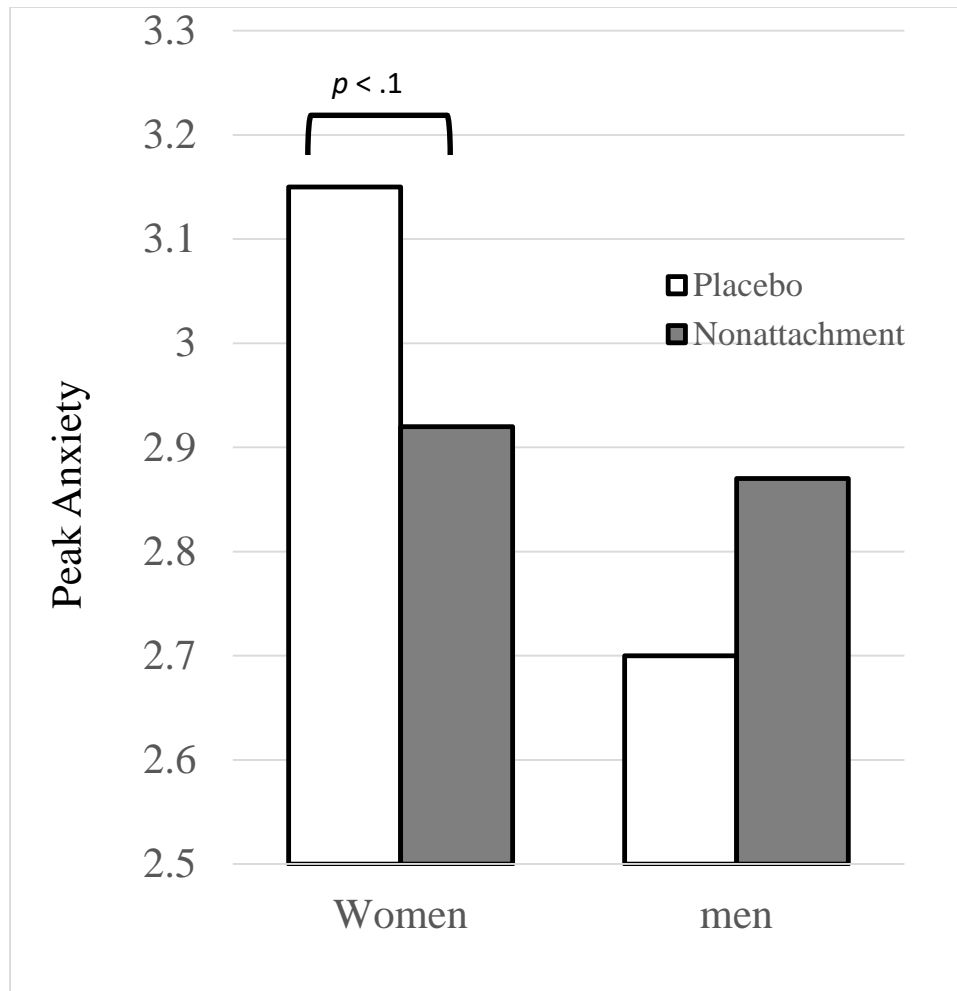


Figure 2. Peak Anxiety as a Function of Gender and Induction Condition

Trait nonattachment effects. As with threat appraisal, the nonattachment induction was expected to be more effective in reducing anxious reactivity and enhancing recovery among those who reported less dispositional nonattachment (NAS). To test for this moderation effect, I

combined the 2 (induction) by 3 (time) ANOVA from above with a continuous covariate in the form of centered NAS scores using a General Linear Model (GLM). As in the PASA analyses, the present model indicated a robust main effect for NAS, $F(1, 164) = 62.73, p < .001, \eta_p^2 = .28$, such that people with higher (+1 *SD*) NAS scores were less anxious (Est. $M = 1.99$) than people with low NAS (-1 *SD*) scores (Est. $M = 2.44$). The Time by NAS interaction was not significant, $F(2, 328) = .5, p = .609$. More relevant to the present hypotheses, however, the analysis revealed an Induction by NAS interaction, $F(1, 164) = 6.42, p = .012, \eta_p^2 = .04$. This 2-way interaction, on the other hand, was not modified by Time, $F(1, 164) = 2.01, p = .158$.

Even though the 3-way interaction was not significant, it should be recognized that induction effects should not be present at baseline. Because this is true, I performed further analyses examining each time point separately. The Induction by NAS interaction was significant at peak, $F(1, 174) = 6.5, p = .011, \eta_p^2 = .04$, but not during the baseline, $F(1, 164) = 1.26, p = .263$, or recovery, $F(1, 174) = 1.3, p = .256$, phases. In the peak phase, a median split performed using NAS scores suggested that the nonattachment training was more helpful at low NAS levels ($M_{\text{placebo}} = 3.20, M_{\text{nonattach}} = 3.02$), $F(1, 83) = 2.13, p = .148$, than at high NAS levels ($M_{\text{placebo}} = 2.68, M_{\text{nonattach}} = 2.79$), $F(1, 82) = .5, p = .481$.

Implicit Negative Emotion

Again supporting the efficacy of the stress task, a 2 (Induction) by 3 (Time) ANOVA suggested a significant effect of Time, $F(2, 334) = 18.14, p < .001, \eta_p^2 = .10$. Subsequent ANOVAs confirmed that implicit negative emotion levels were significantly higher in the peak stress phase ($M = 2.25$) than at baseline ($M = 1.97$), $F(1, 167) = 34.55, p < .001, \eta_p^2 = .17$, and that anxiety scores dropped from peak to recovery ($M = 1.99$), $F(1, 174) = 32.73, p < .001, \eta_p^2 = .16$. A further pairwise comparison indicated that the recovery phase was no different than

baseline, $F(1, 167) = 2.3, p = .131$, indicating that recovery was generally successful. In the initial 2 by 3 ANOVA, there was no main effect for Induction, $F(1, 167) = .11, p = .742$, nor was the expected Induction by Time interaction present, $F(2, 334) = 1.0, p = .370$.

Gender effects. In a further ANOVA, I added gender as an additional factor. In a pattern paralleling the explicit anxiety measure, there was a main effect for Gender, $F(1, 165) = 4.04, p = .046, \eta_p^2 = .02$, such that implicit anxiety scores were higher among women ($M = 2.13$) than men ($M = 2.00$). There was no Time by Gender interaction, $F(2, 330) = 2.47, p = .127$. Also, contrary to the PASA and STAI-S analyses, this model did not indicate an Induction by Gender, $F(1, 165) = .43, p = .512$, or an Induction by Time by Gender, $F(2, 165) = .07, p = .933$, interaction.

Trait nonattachment effects. As with previous models, the nonattachment induction was expected to be more effective in reducing implicit negative affect among those who reported less NAS. Continuous variations in NAS scores were added to the normative design within a GLM platform. In contrast to the PASA and STAI-S analyses, this model did not indicate a robust main effect for NAS, $F(1, 164) = .76, p = .390$, or a Time by NAS interaction, $F(2, 328) = 1.56, p = .211$. A marginal Induction by NAS interaction was present, $F(1, 164) = 2.88, p = .092, \eta_p^2 = .02$, but more pertinent to the present hypotheses, this interaction was qualified by an Induction by Time by NAS interaction, $F(2, 164) = 4.78, p = .009, \eta_p^2 = .03$.

To more directly evaluate the hypotheses, I ran two further GLMs that focused on reactivity (baseline versus peak) and recovery (baseline versus recovery). These models revealed Induction by Time by NAS interactions in terms of peak reactivity $F(1, 164) = 6.17, p = .014, \eta_p^2 = .04$, and recovery, $F(1, 164) = 9.63, p = .002, \eta_p^2 = .06$. To better understand these 3-way interactions, I computed difference scores to reflect changes from baseline, and also performed a

median split along the NAS dimension. Means revealed that the training reduced peak reactivity at low NAS ($M_{\text{placebo}} = .41$, $M_{\text{nonattach}} = .10$), $F(1, 80) = 8.6$, $p = .004$, $\eta_p^2 = .05$, while having little effect on high NAS individuals ($M_{\text{placebo}} = .27$, $M_{\text{nonattach}} = .30$), $F(1, 79) = .23$, $p = .819$. In terms of recovery, means suggested that the nonattachment training reduced negative affect (relative to baseline) to a greater extent among low NAS people ($M_{\text{placebo}} = .17$, $M_{\text{nonattach}} = -.05$), $F(1, 80) = 4.67$, $p = .034$, $\eta_p^2 = .06$, than among high NAS people ($M_{\text{placebo}} = -.01$, $M_{\text{nonattach}} = -.03$), $F(1, 79) = .03$, $p = .859$. These findings support the hypothesized interaction between nonattachment training and dispositional nonattachment.

Willingness to Deliver Speech

Because the willingness items asked different questions at each time point, there were no hypotheses concerning how willingness might change as a function of time. At baseline, for instance, participants reported their willingness to be selected as the speaker of the day in a hypothetical way. By contrast, the willingness to speak variable within the peak phase was no longer a hypothetical matter. Accordingly, the effects of time in the analyses that follow should be treated with a grain of salt.

Regardless, I ran a 2 (nonattachment, placebo) by 3 (baseline, peak, recover) ANOVA to understand the pattern of findings. This model indicated a significant effect of Time, $F(2, 163) = 43.07$, $p < .001$, $\eta_p^2 = .21$. Surprisingly, people indicated a greater willingness to speak during the peak phase ($M = 3.7$, $SD = 1.87$) than at baseline ($M = 2.74$, $SD = 2.00$), $F(1, 163) = 29.35$, $p < .001$, $\eta_p^2 = .15$, possibly because they had committed to giving the speech. Willingness to speak reached its highest level during recovery ($M = 4.5$, $SD = 2.51$). Although there was an effect for Time, there was no main effect for Induction, $F(1, 163) = 1.97$, $p = .162$, and the hypothesized Induction by Time interaction was also not significant, $F(2, 326) = .31$, $p = .768$.

Gender effects. To investigate the effects of gender, an initial 3 (Time) by 2 (Induction) by 2 (Gender) ANOVA was conducted. This model indicated a main effect for Gender, $F(1, 161) = 8.48, p = .004, \eta_p^2 = .05$. Similar to other measures, this effect was characterized by women tending to report lesser willingness ($M = 3.33, SD = 2.03$) than men ($M = 4.10, SD = 2.21$). There was not a gender by induction interaction, $F(1, 161) = .5, p = .482$, nor was there a three-way interaction, $F(2, 322) = 1.47, p = .232$. Even so, the willingness variable has a different meaning at the different time points. Because this is true, and because gender differences tended to be pronounced with respect to the other dependent measures, I ran gender by induction ANOVAs for each time point separately.

At baseline, there was a marginal main effect of Gender, where women were again less willing to speak, $F(1, 161) = 3.24, p = .074, \eta_p^2 = .02$, and no significant interaction, $F(1, 161) = .02, p = .895$. At peak phase, women were significantly less willing to proceed than men, $F(1, 171) = 7.49, p = .007, \eta_p^2 = .04$. Additionally, there was an Induction by Gender interaction, $F(1, 171) = 4.93, p = .028, \eta_p^2 = .03$, characterized by the nonattachment induction marginally increasing willingness for women ($M_{\text{placebo}} = 3.06, M_{\text{nonattach}} = 3.71$), $F(1, 99) = 3.37, p = .069, \eta_p^2 = .03$, but not men ($M_{\text{placebo}} = 4.43, M_{\text{nonattach}} = 3.82$), $F(1, 72) = 1.81, p = .183$. At recovery, there was a similar main effect of Gender as above, $F(1, 170) = 7.03, p = .009, \eta_p^2 = .04$, but with no interaction, $F(1, 170) = .01, p = .916$. In partial support of hypotheses, these results suggest that the induction was beneficial in reducing peak avoidance among women, but not men.

Trait nonattachment effects. As with previous models, the nonattachment induction was expected to be more effective in increasing willingness to speak among those reporting less dispositional nonattachment (NAS). Accordingly, I ran a GLM version of the initial 3 by 2 ANOVA, with NAS as an additional predictor. In line with PASA and STAI-S analyses, a main

effect for NAS was identified, $F(1, 160) = 23.66, p < .001$, and estimated means collapsing across time points suggested that high NAS scores were associated with greater willingness to speak (Est. $M = 4.36$) than were low NAS scores (Est. $M = 3.06$). The hypothesized Induction by NAS interaction, $F(2, 320) = 4.702, p = .047, \eta_p^2 = .02$, was also present, but the expected 3-way effect was not significant, $F(2, 320) = .26, p = .773$.

To further investigate the reliability of the induction by NAS interaction, I reran the above analysis with the baseline condition dropped because the baseline time period occurred prior to the induction. In this GLM, too, there was an Induction by NAS interaction, $F(1, 169) = 3.97, p = .048, \eta_p^2 = .02$, confirming the reliability of the phenomenon. The induction tended to be helpful at low ($-1 SD$) levels of NAS (Est. $M_{\text{placebo}} = 3.00$, Est. $M_{\text{nonattach}} = 3.80$), while showing little effect at high ($+1 SD$) levels of NAS (Est. $M_{\text{placebo}} = 4.98$, Est. $M_{\text{nonattach}} = 4.67$). To the extent that willingness to speak reflects speech-related stress and anxiety, these estimated means support the expectation that the induction would be particularly valuable for people who would most benefit from the concepts of nonattachment.

Additional Analyses

Because the PASA, STAI-S, and willingness results suggest that the nonattachment training was more stress-reductive for women, some additional analyses were conducted to delve into this pattern of effects. Specifically, I was interested in whether women were more receptive to the information, thus explaining the gender by induction patterns that tended to occur. An alternative possibility is that both men and women found the nonattachment induction information to be valuable and used the training, but only women benefitted from it.

Accordingly, a series of 2 (induction) by 2 (gender) ANOVAs were calculated to test for gender effects on the training value, use, and helpfulness measures. There were no Induction by

Gender interactions for either the training value, $F(1, 164) = 0, p = .950$, or helpfulness, $F(1, 164) = .45, p = .503$, measures. There was, however, an Induction by Gender interaction with respect to people's reports of paying attention to the information they received and using it during the speech, $F(1, 164) = 4.47, p = .036, \eta_p^2 = .$ Contrary to expectations, men reported using the nonattachment lessons *more* ($M = 5.15, SD = 1.05$) than women ($M = 4.86, SD = 1.30$), and women reported using the placebo information more ($M = 5.18, SD = 1.22$) than men ($M = 4.61, SD = 1.64$). These results suggest that the differential effects of the induction on women and men are apparently not based simply on gender differences in training value, use, or helpfulness. These results do not preclude, and seem to strengthen, the previous contention that the observed gender effects across dependent variables may be due to in part to the nonattachment induction being more effective among those who tended to experience greater distress (i.e., women).

The preceding perspective on gender differences received confirmation with a more direct analysis. Namely, a multiple regression predicting peak STAI-S from induction condition, baseline STAI-S levels, and their interaction revealed a marginally significant induction by baseline anxiety interaction, $b = -.18, t = -1.85, p = .066$. To understand this interaction, I split the participants in half on the basis of their baseline anxiety scores. Simple regressions revealed that the training manipulation ($-1 = \text{placebo}, +1 = \text{nonattachment}$) was more effective among those higher in baseline anxiety ($M_{\text{placebo}} = 3.26, M_{\text{nonattach}} = 3.00$), $b = -.13, t = -1.77, p = .082$, than among those low in baseline anxiety ($M_{\text{placebo}} = 2.71, M_{\text{nonattach}} = 2.83$), $b = .06, t = .78, p = .440$.

GENERAL DISCUSSION

I hypothesized, first, that the N-A induction would increase N-A beliefs (relative to the placebo condition), and the present data support this hypothesis. This finding is important because no research that I am aware of has shown the successful enhancement of nonattached (or closely related) beliefs. While the effect was rather small ($r = .18$), this result suggests that a cognitive induction of the type described by the Buddha (“the three marks of existence”) can have the desired effect of enhancing non-attached mind-sets. The development of nonattachment is the central goal of all Buddhist training, and so these beliefs should not be easy to alter in a 12-minute training. Thus, the fact that such a training was successful (although with a small effect) is a sign that the original Buddhist texts may contain wisdom that has not been fully leveraged within empirical psychology. Even more encouraging for stress and quality of life research, these nonattachment beliefs were a highly reliable ($|r| = .18-.37$) predictor of *all* present indices of anxiety reactivity and recovery (threat appraisal, self-reported anxiety, implicit negative affect, and willingness). Given this, future research should test the efficacy of more extensive cognitive interventions that might be capable of increasing N-A beliefs to a more dramatic extent.

Beyond increasing nonattachment beliefs, the present study also sought to assess the benefits of N-A in terms of stress reactivity and recovery. These hypotheses are discussed in turn. In terms of reactivity, the N-A induction was expected to reduce perceived threat of the speech, an important elicitor of autonomic stress reactivity (Folkman et al., 1986). This hypothesis was supported, suggesting that a relatively small increase in nonattached views can be helpful in reducing feelings of social threat, and potentially improving quality of life.

Regarding self-reported anxious reactivity, the N-A induction was expected to be protective in the moments prior to the speech task. This reactivity was measured in three ways:

self-reported anxiety, implicit negative affect, and willingness to proceed with one's speech. In general terms, results did not directly confirm my reactivity hypotheses. However, the N-A induction tended to reduce peak reactivity among women, as measured by self-reported anxiety. Similarly, the training significantly increased willingness to speak at peak phase (given the chance to opt out), but only among women. These results provide some support for the hypothesized effect of the nonattachment training on anxious reactivity.

To interpret this gender effect, it should be acknowledged that women tend to report higher levels of anxiety than men do (Caballo et al., 2014), and studies investigating questions of stress reactivity often recruit all female samples for this reason (e.g., Eiffert & Heffner, 2003; Shallcross, Troy, Boland, & Mauss, 2010). In line with research of this type, the present investigation found women to be more threatened by the speech task, and they also felt greater peak stress than men. Given such findings, as well as the present data, a parsimonious explanation for the interaction of gender and training would simply be that the N-A training was more helpful among those who would otherwise be more reactive to the speech task. This interpretation is supported by an analysis showing that the nonattachment training was especially helpful in reducing peak anxiety among people reporting greater baseline anxiety.

A second possible explanation for the gender effect pertains to the fact that the N-A training asked people to directly acknowledge and accept the negative emotions that they were feeling. This type of strategy may be less compatible with men's tendencies toward stoicism and suppression (Timmers, Fischer, & Manstead, 1998), and more compatible with women's tendencies toward free acknowledgement of negative emotion (Brody & Hall, 2000).

Taken together, these reactivity data provide partial support for the hypothesized capability of nonattached mind-sets to reduce peak anxious reactivity. Importantly, even this

partial support represents a unique finding. Although past research has shown that a conception of N-A focusing narrowly on emotional acceptance led to increased recovery rates (e.g., Campbell-Sills et al., 2006), no studies to my knowledge have shown decreased peak reactivity as a function of N-A or closely related beliefs and attitudes. Thus, the fact that the present induction showed some stress alleviation properties among stress-prone people attests to the potential benefits of inductions that more closely follow relevant Buddhist theory, relative to inductions that more loosely follow such theory (Desbordes et al., 2015).

With respect to anxiety recovery, the hypothesized effects did not occur. This finding is contrary to the related literature, where past research suggests that the benefits of acceptance/openness strategies are particularly evident in recovery or post-stressor periods (Campbell-Sills et al., 2006; Marcks & Woods, 2003). The present null effects could be due to a lack of a significant stress/anxiety effect (relative to baseline) in the recovery time point. If there was little stress to mitigate, the induction may not have been particularly useful.

This lack of support for recovery hypotheses could also be the result of my expectations being based on research investigating *emotional acceptance*. Emotional acceptance (the tendency to be open to the experience of negative emotion) requires negative emotion to be present to work, which might explain why emotional acceptance has in past research resulted in a more rapid return to baseline rather than in the mitigation of peak reactivity. By contrast, a nonattachment training (focused on acceptance of both events and emotions) should theoretically act earlier in the emotion generation chain. For instance, the present impromptu speech task should generate anxiety to the extent that people expect a threat to a salient goal (i.e., maintaining one's positive social status; Gross, 2015). Because N-A induces alterations in salient

social goals (Goldstein, 2002), the present training may primarily target initial emotion generation/reactivity processes rather than those related to recovery.

Based on previous research (Feldner et al., 2003), it was expected that the nonattachment training could be more beneficial among those reporting less nonattachment-oriented beliefs. I found mixed support for this hypothesis. Such an effect was present (although marginal) in terms of threat appraisals, and significant support came from implicit negative emotion levels. However, the self-reported anxiety and willingness variables did not exhibit this pattern.

The induction by NAS interactions that did occur could be interpreted similarly to the moderating effects of gender. That is, the moderating effect of NAS might be driven by the nonattachment induction being more helpful for those who felt more threatened (i.e., low NAS people). A second potential interpretation is that nonattachment-related ideas were more beneficial to those who tended to be less familiar with these concepts/attitudes, such as might be expected among those who reported being less nonattached in their daily lives.

CONCLUSIONS

From an individual difference standpoint, there was strong support for the protective role of nonattachment. With respect to the induction, it did alter the beliefs that I sought to alter, but the effect size was small to medium. Even so, nonattachment lessons were able to decrease threat appraisals and peak stress reactivity, though only among women. These results encourage continued research into nonattachment inductions, which may improve quality of life to a greater extent in the context of interventions that have greater power to change the relevant beliefs.

There are also theoretical reasons for continuing with this research. The concept of nonattachment is a broader construct than emotional acceptance is. In addition, there are reasons for thinking that a nonattached mind-set could alter emotional processes at a very early stage, relative to the recovery-centric effects of acceptance. Indeed, the Buddha claimed that a lifetime of practicing nonattachment has the potential to eliminate all human suffering, a possibility consistent with the processes I have just emphasized. Given that many have questioned the empirical efficacy of the cognitive intervention techniques commonly in use in CBT therapy (Dimidjian et al., 2006; Haeffel, 2010; Longmore & Worrell, 2007), cognitive techniques of the present type, if studied further, could be more efficacious.

Some additional considerations for future research should be mentioned. Although I have focused on the development of nonattachment toward 6 of the 8 primary attachments indicated in Buddhist texts (pleasure and pain, praise and blame, fame and ill-repute), future research on N-A should explore the emotion generation/regulation benefits of overcoming attachment to “gain and loss” experiences. For example, N-A inductions targeting the loss of one’s job or valued material possessions could help afflicted individuals recognize that these occurrences are a natural feature of living rather than an ultimate failure of the self (Bodhi, 2005). Finally, future

research should investigate the benefits of longer-term N-A training (e.g., over the course of months in an MBSR-type workshop).

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- Arch, J. J., Landy, L. N., & Brown, K. W. (2016). Predictors and moderators of biopsychological social stress responses following brief self-compassion meditation training. *Psychoneuroendocrinology, 69*, 35-40.
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky Inventory of Mindfulness Skills. *Assessment, 11*, 191-206.
- Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., ... & Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and non-meditating samples. *Assessment, 15*, 329-342.
- Bodhi, B. (2005). *In the Buddha's words: An anthology of discourses from the Pali canon*. Boston, MA: Wisdom Publications.
- Bodhi, B. (trans., 2013). *Transcendental dependent arising: A translation and exposition of the Upanisa Sutta*. Retrieved from <http://www.accesstoinsight.org/lib/authors/bodhi/wheel277.html>
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., ... & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*, 676-688.
- Brody, L. R., & Hall, J. A. (2000) Gender, emotion, and expression. In: M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 325-414). New York, NY: Guilford Press.

- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*, 822–848.
- Caballo, V. E., Salazar, I. C., Irurtia, M. J., Arias, B., Hofmann, S. G., & CISO-A Research Team. (2014). Differences in social anxiety between men and women across 18 countries. *Personality and Individual Differences*, *64*, 35-40.
- Campbell-Sills, L., Barlow, D. H., Brown, T. A., & Hofmann, S. G. (2006). Effects of suppression and acceptance on emotional responses of individuals with anxiety and mood disorders. *Behaviour Research and Therapy*, *44*, 1251-1263.
- Carlson, L.E. & Brown, K.W. (2005). Validation of the Mindful Attention Awareness Scale in a cancer population. *Journal of Psychosomatic Research*, *58*, 29-33.
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Das, L. S. (2009). *Awakening the Buddha within: Eight steps to enlightenment*. Boston, MA: Harmony.
- Davids, T. W. R., Stede, W. (1921). *The Pali-English dictionary*. Delhi, India: Motilal Banarsidass.
- Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S. W., & Vago, D. R. (2015). Moving beyond mindfulness: defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness*, *6*, 356-372.
- Dickerson, S.S., Kemeny, M.E., (2004). Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. *Psychology Bulletin*, *130*, 375–391

- Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmaling, K. B., Kohlenberg, R. J., Addis, M. E., ... & Atkins, D. C. (2006). Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. *Journal of Consulting and Clinical Psychology, 74*, 658.
- Easwaran, E. (1987). *The dhammapada*. London, UK: Arkana.
- Eisenberger, N. I., & Cole, S. W. (2012). Social neuroscience and health: neurophysiological mechanisms linking social ties with physical health. *Nature Neuroscience, 15*, 669-674.
- Eifert, G. H., & Heffner, M. (2003). The effects of acceptance versus control contexts on avoidance of panic-related symptoms. *Journal of Behavior Therapy and Experimental Psychiatry, 34*, 293-312.
- Ellsworth, P. C., & Scherer, K. R. (2003). Appraisal processes in emotion. In R. J. Davidson, K.R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 572-592). New York, NY: Oxford University Press.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191.
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*, 177-190.
- Feldner, M. T., Zvolensky, M. J., Eifert, G. H., & Spira, A. P. (2003). Emotional avoidance: An experimental test of individual differences and response suppression using biological challenge. *Behaviour Research and Therapy, 41*, 403-411.

- Fresco, D. M., Coles, M. E., Heimberg, R. G., Leibowitz, M. R., Hami, S., Stein, M. B., & Goetz, D. (2001). The Liebowitz Social Anxiety Scale: A comparison of the psychometric properties of self-report and clinician-administered formats. *Psychological Medicine, 31*, 1025-1035.
- Gaab, J., Rohleder, N., Nater, U. M., & Ehlert, U. (2005). Psychological determinants of the cortisol stress response: the role of anticipatory cognitive appraisal. *Psychoneuroendocrinology, 30*, 599-610.
- Glynn, L. M., Christenfeld, N., & Gerin, W. (2002). The role of rumination in recovery from reactivity: Cardiovascular consequences of emotional states. *Psychosomatic Medicine, 64*, 714-726.
- Goldstein, J. (2002). *One dharma: The emerging western Buddhism*. San Francisco, CA: Harper.
- Gombrich, R. F. (2006). *Theravada Buddhism: A social history from ancient Benares to modern Colombo*. London, UK: Routledge.
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*, 41-54.
- Gross, J. J. (1998). The emerging field of emotion regulation: an integrative review. *Review of general psychology, 2*, 271.
- Gross, J. (2015). Emotion regulation: Conceptual and empirical foundations. In J. Gross (Ed.), *Handbook of emotion regulation* (pp. 1-21). New York: Guilford Press.

- Haefffel, G. J. (2010). When self-help is no help: Traditional cognitive skills training does not prevent depressive symptoms in people who ruminate. *Behaviour Research and Therapy*, 48, 152-157.
- Hayes, S. C., Bissett, R. T., Korn, Z., & Zettle, R. D. (1999). The impact of acceptance versus control rationales on pain tolerance. *The Psychological Record*, 49, 33-42.
- Harvey, P. (2013). *An introduction to Buddhism: Teachings, history, and practices*. New York: Cambridge University Press.
- Helbig-Lang, S., Rusch, S., Rief, W., & Lincoln, T. M. (2015). The strategy does not matter: Effects of acceptance, reappraisal, and distraction on the course of anticipatory anxiety in social anxiety disorder. *Psychology and Psychotherapy: Theory, Research and Practice*, 88, 366-377.
- Heppner, W. L., Spears, C. A., Correa-Fernández, V., Castro, Y., Li, Y., Guo, B., ... & Cinciripini, P. M. (2015). Dispositional mindfulness predicts enhanced smoking cessation and smoking lapse recovery. *Annals of Behavioral Medicine*, 22, 1-11.
- Herbert, J. D., & Forman, E. M. (2011). *Acceptance and mindfulness in cognitive behavior therapy: Understanding and applying the new therapies*. New York: John Wiley & Sons.
- Hofmann, S. G., Heering, S., Sawyer, A. T., & Asnaani, A. (2009). How to handle anxiety: The effects of reappraisal, acceptance, and suppression strategies on anxious arousal. *Behaviour Research and Therapy*, 47, 389-394.
- Ju, S. J., & Lee, W. K. (2015). Mindfulness, non-attachment, and emotional well-being in Korean adults. *Advanced Science and Technology Letters*, 87, 68-72.
- Lamis, D. A., & Dvorak, R. D. (2014). Mindfulness, nonattachment, and suicide rumination in college students: the mediating role of depressive symptoms. *Mindfulness*, 5, 487-496.

- Longmore, R. J., & Worrell, M. (2007). Do we need to challenge thoughts in cognitive behavior therapy? *Clinical Psychology Review, 27*, 173-187.
- Low, C. A., Stanton, A. L., & Bower, J. E. (2008). Effects of acceptance-oriented versus evaluative emotional processing on heart rate recovery and habituation. *Emotion, 8*, 419-431.
- Marcks, B. A., & Woods, D. W. (2005). A comparison of thought suppression to an acceptance-based technique in the management of personal intrusive thoughts: A controlled evaluation. *Behaviour Research and Therapy, 43*, 433-445.
- Marteau, T. M., & Bekker, H. (1992). The development of a six-item short-form of the state scale of the Spielberger State—Trait Anxiety Inventory (STAI). *British Journal of Clinical Psychology, 31*, 301-306.
- Michalak, J., Teismann, T., Heidenreich, T., Ströhle, G., & Vocks, S. (2011). Buffering low self-esteem: The effect of mindful acceptance on the relationship between self-esteem and depression. *Personality and Individual Differences, 50*, 751-754.
- Miller, G., Chen, E., & Cole, S. W. (2009). Health psychology: Developing biologically plausible models linking the social world and physical health. *Annual Review of Psychology, 60*, 501-524.
- Quirin, M., Kazén, M., & Kuhl, J. (2009). When nonsense sounds happy or helpless: The Implicit Positive and Negative Affect Test (IPANAT). *Journal of Personality and Social Psychology, 97*, 500-516.
- Phan, K. L., Fitzgerald, D. A., Nathan, P. J., & Tancer, M. E. (2006). Association between amygdala hyperactivity to harsh faces and severity of social anxiety in generalized social phobia. *Biological Psychiatry, 59*, 424-429.

- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*, 437-448.
- Robinson, M. D. (2007). Lives lived in milliseconds: Using cognitive methods in personality research. In R. W. Robins, R. C. Fraley, R. F. Krueger, R. W. Robins, R. C. Fraley, R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 345-359). New York, NY: Guilford Press.
- Robinson, M. D., & Tamir, M. (2005). Neuroticism as mental noise: a relation between neuroticism and reaction time standard deviations. *Journal of Personality and Social Psychology, 89*, 107.
- Sahdra, B. K., Shaver, P. R., & Brown, K. W. (2010). A scale to measure nonattachment: A Buddhist complement to Western research on attachment and adaptive functioning. *Journal of personality assessment, 92*, 116-127.
- Sahdra, B. K., Ciarrochi, J., Parker, P. D., Marshall, S., & Heaven, P. (2015). Empathy and nonattachment independently predict peer nominations of prosocial behavior of adolescents. *Frontiers in Psychology, 6*, ArtID: 263, ISSN: 1664-1078.
- Shallcross, A. J., Troy, A. S., Boland, M., & Mauss, I. B. (2010). Let it be: Accepting negative emotional experiences predicts decreased negative affect and depressive symptoms. *Behaviour Research and Therapy, 48*, 921-929.
- Simons, J. S., & Gaher, R. M. (2005). The Distress Tolerance Scale: Development and validation of a self-report measure. *Motivation and Emotion, 29*, 83-102.
- Steptoe, A., & Marmot, M. (2006). Psychosocial, hemostatic, and inflammatory correlates of delayed poststress blood pressure recovery. *Psychosomatic Medicine, 68*, 531-537.

- Thanissaro, B. (2010). *Lokavipatti Sutta: The failings of the world*. Retrieved from <http://www.accesstoinsight.org/tipitaka/an/an08/an08.006.than.html>
- Thanissaro, B. (2013). *Dhammacakkappavattana sutta: Setting the wheel of Dhamma in motion*. Retrieved from <http://www.accesstoinsight.org/tipitaka/sn/sn56/sn56.011.than.html>
- Teper, R., & Inzlicht, M. (2014). Mindful acceptance dampens neuroaffective reactions to external and rewarding performance feedback. *Emotion, 14*, 105.
- Tevijjo, A. (2006). *A compendium of sources for introductory Buddhist study*. Retrieved from <http://www.stefan.gr/buddhism/books/dhammacakkappavattana-sutta/dhammacakkappavattana-sutta.pdf>
- Timmers, M., Fischer, A.H. and Manstead, A.S.R. (1998) Gender Differences in Motives for Regulating Emotions. *Personality and Social Psychology Bulletin, 24*, 974–985.
- Tran, U. S., Cebolla, A., Glück, T. M., Soler, J., Garcia-Campayo, J., & Von Moy, T. (2014). The serenity of the meditating mind: A cross-cultural psychometric study on a two-factor higher order structure of mindfulness, its effects, and mechanisms related to mental health among experienced meditators. *PloS One, 9*, e110192.
- Tull, M. T., Gratz, K. L., Salters, K., & Roemer, L. (2004). The role of experiential avoidance in posttraumatic stress symptoms and symptoms of depression, anxiety, and somatization. *Journal of Nervous and Mental Disease, 192*, 754–761.
- Tull, M. T., Barrett, H. M., McMillan, E. S., & Roemer, L. (2007). A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. *Behavior Therapy, 38*, 303-313.

- Wang, S. Y., Wong, Y. J., & Yeh, K. H. (2015). Relationship Harmony, Dialectical Coping, and Nonattachment Chinese Indigenous Well-Being and Mental Health. *The Counseling Psychologist, 44*, 78-108.
- Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*, 5.
- Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*, 616–640.
- Wolgast, M., Lundh, L. G., & Viborg, G. (2011). Cognitive reappraisal and acceptance: An experimental comparison of two emotion regulation strategies. *Behaviour Research and Therapy, 49*, 858-866.

APPENDIX A. PLACEBO SPEECH TRAINING

Based on subject number, you have been randomly selected to present a speech in about 20 minutes. Your speech will be at least 10 minutes long and focused on a topic we will assign. You will attempt to persuade a group of at least 5 trained judges. We will now provide you with a short 12-minute public speaking training which contains helpful research-supported strategies for effective persuasive speaking. Please try to internalize this useful information. After each section, you will be asked to complete several exercises designed to help you learn and use the strategies.

Public speaking can be difficult. This training will give you some tips to help you give the most persuasive speech you can.

Part 1: General Tips

Organize Your Thoughts. Of course, the first thing a speaker must do is have something to say! When giving a persuasive speech to a group of strangers, be sure to take some time to consider some ideas for your speech. Then think about those ideas and try and elaborate on each one in turn. You probably will not memorize this information, but research suggests your main ideas will be more accessible in memory simply by writing them down. Organizing your thoughts prior to speaking can go a long way in helping you give a good persuasive speech.

Consider Your Audience. One of the most important things to remember about giving a persuasive speech is that you are speaking to an audience. Is the audience a group of your classmates? If so, what are some points about the topic that they might find interesting? Consider adding anecdotes that other NDSU students might relate to, or peppering your speech with bits of humor to keep your listeners interested. The more you can relate to your audience's experiences, the better - and the more positively you're likely to be received. Similarly, when forming your points, try and use information or logic that your audience can relate to.

Pause, Project and Speak Clearly. To project is a deliberate effort to extend the range of one's voice. To speak clearly can be thought of in two ways: Clarity can refer to articulating your words carefully. As in "enunciation." The second form of clarity has to do with effectively expressing one's ideas.

When you eventually have a speech written, the question of its actual delivery arises. It is best to not think about speech delivery until after the persuasive speech is at least formatted. How best to present the information? One of the most common pieces of advice from professional public speakers is a very simple one: Make sure everyone can hear you! This is true for two reasons: First, speaking too quietly or timidly can make persuasion much more difficult. Second, if your audience has to strain to hear you, they may lose interest altogether.

Another important tip for clarity is to make sure you stop occasionally to allow your listeners to process what you are saying. Typically, you are clear on what you are saying, but this might not be the case for the listener. The topic could seem foreign and bring up many questions. For these reasons, it can often be useful to slow down. A good way to slow down is to deliberately take

little breaks between each sentence. Or even take a drink of water. Another way to make sure you're pausing enough during your presentation is to take a small breath between each sentence. This is also a great opportunity to smile at your audience and gather your thoughts. Research on persuasive speech suggests that preparing for successful clarity, enunciation, and volume can help one feel prepared and so help one deliver a more effective speech.

Make Eye Contact. Making eye contact with your audience members is an excellent skill to build. Eye contact helps you appear confident and knowledgeable about your subject, plus it helps your audience feel connected to you and the topic you're speaking about. If you are speaking to a small group, try to make eye contact with each person once during your presentation.

Other Hints. When giving your speech it can be useful to move around at least a little bit. Allowing yourself some freedom to explore the space can allow you time to collect your thoughts, and deliver them in a more persuasive and considered way. However, you should not move around too much because that can be distracting to you and your audience. As we talked about earlier, when you speak you want to talk loudly enough for people to hear you. However, it is useful to appropriately vary the volume of your voice in a way that emphasizes the points that you wish to emphasize. These points of emphasis could also be good times to add a pause so that your audience can absorb and reflect on what just said.

The question of questions: Your audience may wish to ask you questions as you are speaking. Sometimes this works, and other times it does not. You should think about how you want to handle possible questions beforehand because doing so can help you be more prepared for questions when they arise. Common ways to deal with questions are: (a) ask the audience before you begin to withhold questions until the end, or (b) pause for questions as part of the speech plan.

Questions. Here are some questions that might help reinforce some of these insights. For each statement, indicate your level of agreement that the statement is true.

- It is good to organize your thoughts prior to giving a speech.
 - True/false
- When you give a speech, it can be useful to make eye contact.
 - True/false
- When in doubt, always speak more quickly than you are.
 - True/false
- Give that the audience is made up of human beings with thoughts and concerns, it can be useful to consider their perspective.
 - True/false
- It makes sense that research shows writing down your ideas can make them more accessible later on.
 - True/false
- I can apply some of the lessons from the training to my speech today.
 - True/false

Part 2: General Preparation Hints

Themes. We are now going to present some information that can be applied to preparing a speech. When you give a speech, it can be useful to have a theme or a point that you wish to make. This larger theme can be supported by more particular sub-themes that collectively converge on the point that you are trying to make. Every speech should probably have multiple themes and sub-themes as it progresses.

Some themes are more narrative and almost poetic. But other themes are more based on logic and argument. Each type of theme can be persuasive, but it depends on the thesis of the speech. We can't tell you exactly what the speech topic is, but as you are planning your speech, remember to consider the type of speech before you decide what your main themes are. Sub-themes may be more consistent across the two types of speeches. They simply support and conform to the chosen theme. The overall number words used are probably consistent across the two types of speeches.

Time Constraints. Sometimes when you have to give a speech, you may not have a great deal of time to prepare. When preparing for a speech without days or weeks to get ready, you should simply take full advantage of the time that you have, even if it is just ten minutes. Here are some expert hints on how exactly you can do this. If you can use these tips successfully, they can aid with your preparations.

The big picture. Not surprisingly, research on persuasive speaking suggests developing the main ideas you will want to talk about is the most important thing you can do during your preparation time. This of course seems quite obvious, but many people become distracted by some detail or another, as opposed to thinking big-picture about what they are going to say. During the initial planning phase, remind yourself not to rush. The initial phase of planning/preparation can be the most important part of preparing a persuasive speech. Make sure you consider all ideas that come to mind, and see how they might fit into your argument.

Examine your topic. When you get your topic after this training, ask yourself some questions: Does the topic lend itself well to a comparison? Examples? Humor? A demonstration? During your preparation time, decide on one method or even several methods and begin jotting down ideas.

When considering the use of humor, some topics such as politics can seem quite dry and serious. However, this does not necessarily mean you can't try a little humor. In fact, finding ways to "switch it up" can have measurable benefits on audience participation and attention, and this attention has been shown to enhance persuasion.

Using examples of your main ideas can be an important part of delivering a persuasive speech. Often, you as the speaker will have a strong understanding of the ideas you are communicating, but your audience will not. For this reason, you should consider adding an example after each important point.

A comparison is another example of a potentially useful tool for the persuasive speaker. Comparisons are similar to examples, but they provide an example of an argument or idea you

are not trying to discuss. If you, for example, are trying to explain what a rainforest is, you might compare a rainforest to a Midwestern forest. These types of mental images can highlight your point or drive it home by making it clear that what you are talking about differs from some comparison standard.

Consider your strengths. Are you best at making your audience laugh or explaining ideas and concepts to others? Some people are naturally good at explaining new ideas or logical concepts, and at the same time, some people are more suited to creating interest and relaxing their audience with a little humor. Take some time and try to identify your strengths. This might help you organize your ideas for the speech. For instance, if your impromptu topic concerns dress codes in school, you may want to joke about your own wardrobe early on in the speech, then re-visit that same theme later in the speech. However, you may be more comfortable expressing your opinion to others. If so, don't try to be funny. Research on public speaking suggests that it can be helpful to pick a style that suits your personality. And, different people have different personalities.

Make good notes. Think of several points and organize them. Try to follow a traditional speech format that utilizes an introduction, body, and conclusion.

The introduction would simply lay out the topic of your impromptu speech: What is it you will be discussing, and possibly what your ideas and main points might be. Then discuss those ideas in more detail in the body. Finally, wrap up with a sort of summary or reinstatement of your main arguments or points.

So, possibly the best thing you can do is jot down an outline. An outline contains main themes and sub-themes, but in some organized structure.”

Questions. Here are some questions that might help reinforce some of these insights. For each statement, indicate your level of agreement that the statement is true.”

- Sub-themes often support larger themes.
 - True/false
- When preparing, it is good to think about the main points that you wish to make.
 - True/false
- Based on the training, “winging it” is often the best idea.
 - True/false
- You should only use humor if you are comfortable with it.
 - True/false
- It makes sense that research shows that structured notes are often helpful.
 - True/false
- I can apply some of the lessons from the training to my speech today.
 - True/false
- I am willing to use these strategies while I prepare for my speech today.
 - Yes/no

APPENDIX B. NONATTACHMENT SPEECH TRAINING

Based on subject number, you have randomly selected to present a speech in about 20 minutes. Your speech will be at least 10 minutes long and focused on a topic we will assign. You will attempt to persuade a group of at least 5 trained judges.

We will now provide you with a short 12-minute public speaking training which contains helpful research-supported strategies for effective persuasive speaking.

Please try to internalize this useful information. After each section, you will be asked to complete several exercises designed to help you learn and use the strategies.

Public speaking can be a difficult experience. Not surprisingly, social psychologists have been studying public speaking for almost 100 years. This research focuses on the main difficulty in public speaking: the anxiety and worry that everyone experiences while giving a speech-

Research suggests that the root cause of public speaking anxiety is a fear of looking bad in the eyes of others. This subtle worry about what others think of us is actually a constant force every day of our lives, but it is often hard to detect: think of the person who says “I don’t care what other people think of me!” while they are fixing their hair just right, or wearing just the right clothes so that everyone will think they are super cool. The goal of this training is to help you give the most persuasive speech you can by encouraging you to become aware of and address the stressful social forces that make persuasive speaking more difficult.

Attachment to “Praise or Blame”

The first section of this training focuses on the root cause of the anxious feelings associated with public speaking (you might be experiencing these feelings right now). This root cause is a non-conscious but powerful need for people to think well of us, and a parallel strong dislike for people thinking badly of us. Researchers like Maslow suggest everyone needs love and acceptance from others, and so the possibility of displeasing others leads to anxiety. Similarly, research by Diener and Seligman suggests that the central, strongest factor leading to general unhappiness may be a constant worrying about what other people think about us.

Unavoidability. Common sense tells us it is unavoidable that, for whatever reason, not everyone will always like us. No matter how hard we try, there will always be people who don’t think we are the cat’s meow. When one thinks in this way, it becomes clear that it is not healthy to need everyone to like us because it is very unlikely this will be the case. In the upcoming speech, for example, no matter how hard you try, you will not give a perfect speech and maybe some judges will rate you poorly. If displeasing some people is an unavoidable part of life, it is wise to let go a little, and try to worry less about keeping everyone happy. Simply go out there for the speech, do your best, and don’t worry too much about what the judges think.

As we discuss letting go of the obsessive concern about what others think about us, it is important to keep in mind that social research does not suggest that you treat others carelessly

without concern for their quality of life. In fact, you should treat other people well, but not because you are overly concerned about what they think about you.

Impermanence. Think of the high school football star or cheerleader who everyone loves and adores and then just 10 years later is just a normal person or maybe even a loser or a has-been! Research tells us that receiving adoration and love from people is often not permanent. Same thing with people being angry at us. This is true because the situations of our lives are always changing and shifting, from minute to minute, day to day, and year to year... one minute our boss is telling us we messed up, the next minute we have a great time with a good friend. So, would it be smart for the star quarterback to live his whole life obsessed with being very popular and loved by everyone again? Not really. No matter how hard we try, friends and lovers come and go. One minute you are giving an embarrassing speech, and the next minute you are relaxing with friends. It is best not to worry too much about how everything is going because things will change again soon!

Non-control. Another research-supported idea is the notion that we just fundamentally do not have control over what other people think about us. This sounds extreme and even wrong, but let's think about it a little- If we did control whether everyone likes us or not, most people would simply make everyone love them! So, does everyone love everyone else? Not quite. Think of the person, and everyone knows someone like this, who just wants so badly to be cool, to be popular, who fails again and again. Does that person control whether or not others love and adore them? They are trying very hard, but for the time being, they have failed. Of course, this is not to say we have no control over anything- we can realize that there are things we do to harm others and push them away, and then change those things, but this is a long and slow process. Research suggests that there are definitely areas in which we have less control, and for these areas, it is extremely useful to let go a little, and not worry too much about it. In fact, persuasion research shows that worrying too much about a presentation may actually decrease its chance of success. Less can be more, and that's great news.

So, to recap: while some people may like us quite a bit, it is inevitable that some others will not. Similarly, our relationships are always changing and shifting; it is perfectly natural for friends and lovers to come and go in our lives. Also, we really don't have a lot of control over some of this stuff! Even if you do your very best to be who everyone wants you to be, even this will not make everyone like you. So, if others' opinions of us are outside our immediate control, constantly shifting and changing, and that it is inevitable that some people just will not understand us, there is wisdom in not being too caught up in what everyone thinks.

In your upcoming speech, try and not be too attached or caught up in how persuasive you are or what the judges think. Just do your best, and remember it can be very destructive to worry too much about what others think of us.

Questions. Here are some questions that might help reinforce some of these insights. For each statement, indicate your level of agreement that the statement is true."

- I have full control over what others think of me.
 - True/false

- From day to day, whether we receive praise or criticism can vary.
 - True/false
- No matter what I do, not everyone will like or understand me.
 - True/false
- Given that I can't make everyone happy, it might be helpful to not worry so much about what other people think about me.
 - True/false
- It makes sense that research shows that constantly worrying what others think of us is a central cause of unhappiness in life.
 - True/false
- I can apply some of the lessons from the training to my speech today.
 - True/false

Attachment to “Pleasure and Pain”

For the second part of the training, we will briefly discuss the worry and anxiety that is caused by the previously discussed concern about making everyone like us. This section will again be followed by some questions.

It should be stated at the outset that many people are not accustomed to thinking specifically about their emotions. While it may be difficult to think in this way, just do your best!

Unavoidability. Research shows that speech anxiety is extremely common. It happens to everyone. It is, for most people, an inevitable result of having to speak publicly. In fact, uncomfortable emotions are simply an unavoidable part of life in general. While we all try to avoid feeling sad or anxious, everyone will feel sad at times. Similarly, everyone will feel worried or embarrassed or angry at times, etc. While we can try to avoid negative emotions, if our efforts are unsuccessful, it can be extremely freeing to kind of “let it be” as the Beatles sang. Just let those emotions be there. No need to fight them. So in terms of how you may be feeling right now, slightly anxious about giving this speech, try and allow those feelings to be there. Just let them be exactly as they are.

Impermanence. Another central reason to let emotions come and go is because they do just that. They come and go. Just like relationships naturally change, people fall in and out of love, etc., so too do our emotions naturally change. In fact, research on depression suggests that obsessing about feeling better can significantly prolong feeling depressed! Emotions are often like the weather, constantly changing, and shifting. Maybe you will feel anxious about giving this speech? All the situation needs is some patience. It will be over in just about 40 minutes! Instead of going around trying frantically to fix everything and make everything perfect, try to develop an attitude of openness to all experiences you have. So what if you feel anxious about the speech? It's best not to obsess about exactly how you are feeling and just be open to your experience. No need to worry about worrying!

Non-control. A related idea about negative emotions like speech anxiety is that, similar to other's opinions about us, anxiety and sadness are very difficult to control. For example, if a person could just say "oh, I don't like this emotion, I think I'll change it," no one would ever feel anxious about speaking. In fact, no one would feel any negativity at all! Of course, we can do things over time to help us feel better, but these thoughtful processes take time to work. Meanwhile, a person really has little immediate control over how they are feeling. So this is yet another reason to just let our emotions be as they are. Otherwise we spend a great deal of time fighting something we have no control over, which research shows often makes things worse!

To recap, common sense and research suggest that feeling anxious about a speech is an inevitable, normal, part of giving a speech. And feeling anxious is, for the most part, out of our immediate control. Feeling anxious is also temporary, and comes and goes- it is not permanent!

So, if feeling anxious about something like this speech is inevitable and unavoidable, out of our control, and temporary, and fighting against it just makes it worse, why not just try and let those feelings be there? Exactly as they are. Rest in this openness. No need to spend your life constantly fighting and swimming upstream. For your speech today, this means if you start to feel nervous or stressed out, try and just allow these feelings to be there. Fighting them or worrying about them just makes them worse!

Questions. Here are some questions that might help reinforce some of these insights. For each statement, indicate your level of agreement that the statement is true."

- I have full control over the feelings I experience.
 - True/false
- If you really pay attention, pleasant or unpleasant emotions are often coming and going from moment to moment or day to day.
 - True/false
- It is inevitable that, no matter how hard I try, I will sometimes feel bad.
 - True/false
- If feeling bad is sometimes inevitable and out of my control, it can be helpful to simply accept how I feel.
 - True/false
- It makes sense that research shows that obsessing over how we feel can actually make things worse.
 - True/false
- I can apply the material from this training to my speech today, and try to be more accepting of feelings of anxiety or embarrassment I might experience.
 - True/false
- Are you willing to try and use this training as you prepare for your speech today?
 - Yes/no

APPENDIX C. QUESTIONNAIRES

Spielberger State-Trait Anxiety Inventory- Short Form (STAI- S) (Marteau et al., 1992)

A number of statements which people have used to describe themselves are given below. Read each statement and then click the most appropriate number to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	Not at all	Somewhat	Moderately	Very much
1. I feel calm	1	2	3	4
2. I am tense	1	2	3	4
3. I feel upset	1	2	3	4
4. I am relaxed	1	2	3	4
5. I feel content	1	2	3	4
6. I am worried	1	2	3	4

Implicit Positive and Negative Affect Test (IPANAT) (Quirin et al., 2009)

The words we use often send sub-conscious messages. Please rate the extent to which the following words from an artificial language fit each of the feeling words. Try to use your intuition and answer without thinking too much.

		Doesn't Fit at All	Fits Somewhat	Quiet Well	Fits Very Well
SAFME	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4
VIKEN	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4
TUNBA	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4
TALEP	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4
BELNI	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4
SUKOV	Inhibited	1	2	3	4
	Happy	1	2	3	4
	Tense	1	2	3	4
	helpless	1	2	3	4

Avoidant Intentions (Developed by Robinson Lab)

Baseline Avoidance: One participant will be asked to give a 10-minute speech during this experiment. Please rate the extent to which you wish to give a speech.

- 1- I strongly prefer not to speak
- 9- I am extremely willing to speak

Peak Avoidance: Because public speaking can be stressful, we wish to remind you that your participation in this experiment is voluntary. Please rate the extent to which you are willing to proceed with the experiment.

- 1- I am extremely unwilling to speak
- 9- I am extremely willing to speak

Recovery Avoidance: If you did not give your speech today, you will still receive credit for the experiment. However, if you are willing, we would prefer to reschedule the experiment, in return for further credit or money. We want to stress that rescheduling the speech would be totally voluntary and you are not obligated to return another time.

Did you give your speech today?

- 1- Yes
- 2- No

If not, how willing are you to reschedule your speech?

- 1- I am extremely unwilling to give my speech another time
- 9- I am extremely willing to give my speech another time

Demand characteristics (Modified from Hayes et al., 1999)

How useful do you think this information will be for your speech today?

- 1- not at all useful
- 9- extremely useful

How valuable do you think this information will be in handling your speech today?

- 1- not at all useful
- 9- extremely useful

Nonattachment Beliefs (Developed by Robinson Lab)

Please indicate your agreement with the following statements:

I should not feel the need to escape or avoid bad experiences in my life.

- 1- Strongly Disagree
- 2- Strongly Agree

I should try to avoid negative or painful thoughts and feelings that come into my mind.

- 1- Strongly Disagree
- 2- Strongly Agree

Instead of avoiding life's difficulties, I should face up to them.

- 1- Strongly Disagree
- 2- Strongly Agree

It is important for me to have an “ideal” life.

- 1- Strongly Disagree
- 2- Strongly Agree

When pleasant experiences end, I should be fine moving on to what comes next.

- 1- Strongly Disagree
- 2- Strongly Agree

Experiencing unpleasant emotions is a totally acceptable part of life.

- 1- Strongly Disagree
- 2- Strongly Agree

Deception Check (Developed by Robinson Lab)

We need to know a little about what you were thinking during the experiment. Please indicate whether you agree or disagree with these statements:

During the speech preparation phase, I expected to give a speech

- 1- Strongly Disagree
- 9- Strongly Agree

I paid attention to the training and used the information during my speech preparation time

- 1- Strongly Disagree
- 9- Strongly Agree