

AN INVESTIGATION OF THE EFFECTIVENESS OF A BRIEF
MEDITATION INTERVENTION ON POSITIVE AND NEGATIVE
AFFECT IN COLLEGE STUDENTS

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By
Lorraine Beverly Webb
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CERTIFICATION OF APPROVAL

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Dr. AnaMarie Guichard
Professor of Psychology

Date

Dr. Kurt Baker
Professor of Psychology

Date

Dr. Victor Luevano
Professor of Psychology

Date

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ABSTRACT

Past research on meditation and stress reduction has found that meditation may have a positive influence on perceived stress and mood. The present study examined whether participants who heard a short, guided meditation would have higher positive affect and lower negative affect as compared to those who listened to a filler video.

Participants were randomly assigned to one of two groups, one of which was a guided meditation and the other was listening to a recipe tutorial for zucchini bread. Pre-manipulation stress and affect were measured through the Perceived Stress Scale and the Positive and Negative Affect Schedule (PANAS). Affect was assessed again after the manipulation. The hypothesis was only partially supported by the data. Although positive affect scores went down for everyone, those in the meditation had a smaller decrease in negative mood, as compared to those in the control group. Both groups had increases in negative mood, but were not significantly different from each other.

The main limitation of this study was that the Perceived Stress Scale was not conducted post-manipulation, therefore, I was only able to assess pre- and post-manipulation affect. Future research might consider using the Perceived Stress Scale pre- and post-intervention, and utilize a longitudinal design to investigate the effects of meditation over a longer period of time.

EXPLAINING STRESS

Stress has the potential to impact the psychological and physical well being of people in a variety of ways, thus, most people use coping skills to minimize the negative impacts of stress. Though stress has been defined in many ways, one of the most commonly used definitions is that stress refers to the ways in which someone responds to the interaction between stressors in their environment and the coping skills used to manage those stressors (McEwen, 2005). In other words, stress is the physiological response that occurs when an individual faces a stressor. Stressors can include financial concerns, relationship strain, job demands, and academic pressures, any of which, can contribute to one's perceived level of stress (Giorgi, Arcangeli, Mucci, & Cupelli, 2015; Bland, Melton, Welle, & Bigham, 2012).

As many college students can attest, effectively coping with stress becomes critically important during one's academic career. Studies have estimated that a majority of college students have experienced various forms of stress while attending school and, furthermore, that stress may contribute to the relatively high prevalence of alcohol abuse, smoking, and eating disorders on college campuses (Piercall & Keim, 2007; Bland et al., 2012). Bland et al. (2012) also described some of the stressors college students may experience, such as the newfound freedom that comes with the transition from high school to college, which can be a challenging adjustment. For many students, previously relied upon coping mechanisms and guidance, such as social support from family, might not be as readily available. While some stress can, in fact, be beneficial and act as a motivator (e.g., students may feel a

mild amount of stress, which may encourage them to work on an assignment earlier, rather than later), too much can lead to a variety of negative effects (Pierceall, 2007).

Responses to Stress

The stress response includes both psychological and physical responses, including anxiety, depression, headaches, and cardiovascular problems, which can affect people's lives in a variety of ways (Bland, Melton, Bigham, & Welle, 2014). For example, anxiety can make simple events and everyday tasks, such as social interactions with friends and attending classes, feel overwhelming (Bland et al., 2012). It is important to note that the way one perceives a stressor can have more of an impact on an individual than the actual stressor itself. In other words, if one is already stressed then their reaction to a new stressor may be determined more by one's pre-existing stress level than the actual stressor itself (Charles, Piazza, Mogul, Sliwinski, & Almeida, 2013). For college students, chronic stress can affect academic progress, social functioning, and personal health (Bland et al., 2012). Next, I will examine some of the negative outcomes associated with the psychological and physical symptoms of stress in order to illustrate the importance of reducing stress.

Psychological Outcomes. The psychological impacts of stress can include irritability, lack of motivation, forgetfulness, anxiety, negative cognitions, and depression (Charles et al., 2013; Chen et al., 2016; van der Zwan et al., 2015). Studies have also shown that higher stress levels are associated with an increase in depressive symptoms and lower self-esteem (Bland et al., 2012). One longitudinal study measured participants' daily stressors and their reactions to these stressors over the

course of a ten-year period (Charles et al., 2013). Measurements were taken twice from 711 adult participants ages 25-74 at the beginning of the study and then again at the end of the study, ten years later. The researchers found that individuals who initially reported higher levels of stress or reported having more negative reactions to their daily stressors also reported higher levels of stress ten years later, as compared to individuals who initially scored low on the stress assessment (Charles et al., 2013). This suggests that the effects of stress can be lasting and may potentially impact one's mental health even after the stressor has occurred (Charles et al., 2013).

Physical Outcomes. Studies have also found that higher stress levels are associated with physical health problems, including a lack of energy, trouble sleeping, headaches, and cardiovascular problems (Farrell, Simpson, Carlson, Englund, & Sung 2016; Berger et al., 1988; Pierceall et al., 2007). High stress levels can also lead to earlier mortality, often due to poor physical health (Giorgi et al., 2015). Additionally, Farrell et al., (2016) measured stress levels in a group of individuals during childhood, again during adolescence, and a final time during adulthood. They found that those who had higher stress levels as children and adolescence, had poorer physical health as adults, specifically higher rates of coronary heart disease. Farrel et al., (2016) also found that people who reported higher stress levels during adolescence also reported increased rates of “proinflammatory tendencies, metabolic syndrome, and headaches” (p.1), meaning stress is associated with a higher chance of high blood pressure, stroke, and diabetes.

When a person experiences high levels of stress, which might result from stressors associated with school, the endocrine and cardiovascular systems have a harder time regulating cortisol, the “stress hormone,” which is released in response to stress (Van der Zwan, de Vente, Huizink, Bogels, & Bruin, 2015). If cortisol levels become chronically elevated, that can lead to problems with memory and difficulties in learning, which can create a vicious cycle by adding to a person’s stress and depression (Van der Zwan et al., 2015). Because of the many negative physical and psychological effects associated with stress and because stress is such a common experience, it is important to understand the effectiveness of different stress reduction techniques. Chen et al. (2016) reported that increased feelings of stress have the potential to have lasting effects and further exacerbate a variety of physical and mental disorders.

Mood Outcomes. The effects of stress on mood have also been studied by researchers. Higher levels stress are related to more negative affect as time progresses (Charles et al., 2013). Peer, Hillman, and Van Hoet (2015) examined how college students respond to stress. Many students said that they felt more anxiety, irritability, depression, hopelessness, etc. when their stress levels were higher (Peer et al., 2015). The researchers suggested utilizing aspects of mindfulness as one of the potential ways to help college students with stress reduction. Another study looked at the relationship between stress, affect, and cardiovascular responses (Dowd, Zautra, & Hogan, 2010). The researchers had participants either give a speech or read journal articles. Those in the speech condition had an increase in negative affect compared to

those who only read the journal articles. They also found that the stress increased negative affect more than it decreased positive affect (Dowd et al., 2010).

Coping With Stress

Carver, Scheier, and Weintraub (1989) examined two types of coping strategies, problem-focused coping and emotion-focused coping. Problem-focused coping is designed to problem solve, or reduce the source of the stress, while emotion-focused coping works to reducing the emotional distress that is associated with a stressor, though both tend to co-occur (Carver & Scheier, 1994).

Unhealthy Coping Mechanisms.

When a person encounters a stressor, it is likely they will look for ways to reduce the stress they experience using emotion and/or problem-focused coping skills. A quantitative study by Bland et al. (2014) examined the physical impacts of stress on 973 college students using self-report questionnaires. They found that many of the students in the sample reported trouble managing their stress and sometimes chose unhealthy ways of reducing stress. Bland et al., (2014) identified six coping skills used by students that were considered to be “risk factors for low stress tolerance”: listening to music (95% of students), sleeping (91.1% of students), surfing the internet (88.6% of students), participating in internet social networks (87.8% of students), calling a friend (78.7% of students), and eating (77.7 of students) (p. 563). While listening to music or using the internet might be effective at taking your mind off of a stressor, if they are used to avoid working through the stressor, then it is likely that stress will not be resolved. It is common for individuals to use

dysfunctional coping strategies for stress reduction, which are found to have little to no effectiveness (Chao, 2011; Van der Zwan et al., 2015). Chao (2011) explained that it can be easier to gratify the immediate frustration of stress by venting to others or masking the stress with alcohol or drugs. Unfortunately, some of these coping mechanisms such as the use of drugs, alcohol, or making unhealthy food choices, can lead to further difficulties (Park & Lacobca, 2016; Tomaka, Morales-Monks, & Shamaley, 2012). Additionally, seeking social support can be an effective coping strategy. For example, if one's friends provide appropriate support, then relying on them could be an effective way of coping with stressors. On the other hand, if friends encourage suppression or avoidance, then they may not be useful sources of support. Piercall and Keim (2007) found that many college students ($n = 212$) would rather use drugs (15%), alcohol (39%), and/or smoking (36%) to cope with stress than talk to a mental health professional. Furthermore, Bland et al. (2012) described how poor coping is positively related to alcohol abuse and smoking.

Research also suggests stress affects food choice, with many individuals choosing higher calorie foods, fewer fruits and vegetables, and a tendency to overeat as stress levels increase (Park & Lacobca, 2016, Zellner et al, 2014). This is consistent with other research where similar results were found (Errisuriz, Pasch, & Perry, 2016; Osdoba, Mann, Redden & Vickers, 2014; Willenbring, Levine, & Morley, 1986). For example, Errisuriz et al. (2016) surveyed college students' dietary choices and stress levels. They found that those who had higher stress were more likely to report a higher consumption of unhealthy foods, which included foods

higher in salt, pre-packaged foods, and fast food. Willenbring et al. (1986) also found a positive correlation between stress level and unhealthy food choice in participants. Specifically, those with higher stress levels preferred sweeter and saltier foods, as compared to those who reported lower stress levels. Additionally, the use of dysfunctional coping skills, such as eating, often leads to more stress because the coping mechanism does not reduce or remove the original stressors and may, in fact, add new ones (e.g., concerns about health, body image) (Chao, 2011). Though there is a large body of research that suggests college students are likely to turn to negative coping mechanisms to reduce stress, it also important to look at the positive strategies students use to reduce stress.

Positive Coping Mechanisms. Fortunately, there is a great deal of research exploring the positive coping mechanisms that are effective at reducing stress, including exercise, interactions with animals, social support, and meditation (Chao, 2011; Piercall & Keim, 2007). Among these coping mechanisms, exercise seems to be effective in stress reduction, as demonstrated by several studies (Berger, Friedman, & Eaton, 1988; Kadiravan & Kumar, 2012). Berger et al. (1988) looked at the effectiveness of jogging, relaxation training, and group interaction/socialization as tools to reduce stress levels. They found that those in the jogging and relaxation training group had lower levels of stress compared to the social interaction group. Though the study reflected lower stress levels for both groups, they found that women had more success than men in overall stress reduction. Additionally, they noted that these techniques would not work with all participants, because some would naturally

prefer alternate methods of stress reduction (Berger et al., 1988). In a study by Kadiravan and Kumar (2012), stress levels in college students were assessed after students were randomly assigned to different coping conditions. The participants were assigned to either the experimental group, in which they learned about coping skills including problem solving, communication, and self-regulation and then applied them for 21 days, or the control group, which received no coping skills intervention. They found that the students in the experimental condition reported lower stress levels at the end of the study, though it was unclear how long the lower levels were maintained after the conclusion of the study. In a study by Kettunen, Vuorimaa, and Vasankari (2014), participants in a 12-month exercise intervention had continued reductions in stress a year after the study was completed. The researchers collected data throughout the course of the study at 4, 8, and 12 months to see if there were any effects during the study. They collected data again one year post-study to see the longer-term results where they found that the exercise participants had lower stress overall. On the other hand, the control group, who did not participate in an exercise intervention, did not have a change in stress level one-year post-study. Kubitz and Landers (1993) also found that exercise reduces the negative influence of stress on the cardiovascular system in addition to being an effective coping mechanism. For example, participants who exercised regularly had a lower heart rate during a stressful situation, as compared to the individuals who did not exercise and thus had a higher heart rate in the same situation.

Mindfulness. Mindfulness is defined as “a state of being attentive to and aware of what is taking place in the present moment, in an accepting and nonjudgmental way” (Nyklicek, Mommersteeg, Van Beugen, Ramakers, & Van Boxtel, 2013, pg. 1110). Mindfulness has been associated with indicators of psychological well being, such as lower levels of anxiety, depression, and stress (Nyklicek et al., 2013; Khoury, Sharma, Rush, & Fournier, 2015). Netz and Lidor (2003) examined exercising while being mindful of the body, also known as *Feldenkrais*, and compared it to physical exercise alone, to see if there were any differences in mood outcomes between the groups. After one session, the participants who practiced Feldenkrais reported a higher increase in mood, as compared to those who did the physical exercise alone (Netz et al., 2003). In another study, Van Der Zwan et al. (2015) found similar results when they examined the effectiveness of exercise, mindfulness meditation, and heart rate alterations as methods of stress reduction. Heart rate alterations, which are similar to mindfulness, allow the participants to focus on their heart rate through the monitor and then work on not letting it get too high or too low through specific breathing exercises that are adapted for their individual body type (Van Der Zwan et al., 2015). In each condition, all participants reported lower stress levels at the end of the study. These results suggest that incorporating mindfulness into exercise allows the participant to be more aware of what they are doing, while simultaneously lowering stress levels.

Mindfulness has also been shown to reduce levels of cortisol, anxiety, insomnia, and pain (Deckro et al., 2002). The goal of mindfulness is to help

individuals observe their thoughts and learn how their thoughts influence their emotions. Therefore, individuals are taught to become more aware of their thoughts, thus facilitating their ability to choose to think more positive thoughts (Deckro et al., 2002). As individuals under stress tend to have an increase in negative thoughts, learning to monitor their thoughts for negative, and often distorted thinking, provides opportunities for those maladaptive thought processes to be challenged (Deckro et al., 2002). One study examined stress levels in college students after a six-week mindfulness intervention. The participants in the intervention group, who were taught to be mindful of their stress levels, had less anxiety, lower perceived stress, and less psychological distress at the end of the study, as compared to the waitlisted participants who received no intervention (Deckro et al., 2002).

Mindfulness-Based Stress Reduction (MBSR) is an eight-week program designed to teach mindfulness (Jazaieri, Goldin, Werner, Ziv, & Gross, 2012; Khoury et al., 2015; Vollestad et al., 2011; Nyklicek, et al., 2013). When MBSR was compared to physical activity, results showed that individuals in the MBSR groups reported less stress than those who only exercised to reduce stress. (Jazaieri et al., 2012; Van Der Zwan et al., 2015). Jazaieri et al. (2012) measured participant outcomes for social anxiety disorder using an MBSR condition, an aerobic exercise (AE) condition, and a waitlist condition in which the participants received no intervention. Over the course of two-months of utilizing the interventions, they used a variety of assessments and found that those who practiced either MBSR or aerobic exercise had lower stress and anxiety symptoms than the control group (waitlist).

Nyklicek et al. (2013) also utilized MBSR as a stress reducer in a group of 88 participants. Individuals were asked to participate in a stress task in which they had to complete a series of math problems and prepare a speech. Measurements of blood pressure, heart rate, and cortisol were taken several times throughout the course of the eight-week study. The experimental group ($n = 44$) completed an MBSR program during the eight weeks, while the control group ($n = 44$) experienced no intervention because they were on a waitlist. After the eight weeks, the waitlisted group then completed the same MBSR program. They found blood pressure levels were lower in participants who completed the initial MBSR training when compared to those who were on the waitlist and had not yet received their training. Thus, researchers have found that MBSR paired with exercise and MBSR alone to be effective at reducing stress.

Additionally, Tunney, Cooney, Coyle, and O'Reilly (2017) looked into the effectiveness of short-term mindfulness exercises in children delivered in an in-person setting compared to one presented via a computer. Results suggested that it was less about the modality used to deliver MBSR, and more about the content delivered in eliciting a relaxation response. Thus, both groups had significantly increased feelings of relaxation. Carissoli, Villani, and Riva (2015) examined the effectiveness of a three-week mindfulness intervention that was delivered to adults through a smartphone app created by the researchers. There were three conditions, a waitlist group who received no intervention, a self-help group who listened to relaxing music twice a day for 15 minutes each session, and the intervention group,

who listened to two, 15-minute guided meditations each day on the app. Stress levels were assessed pre- and post-intervention in all groups and they were also asked to track their heart rates throughout the three weeks. Participants in the music and mindfulness conditions reported lower stress levels and perceived improvement in coping with stress, along with a decrease in average heartbeats per minute. Taken together, these studies demonstrate that mindfulness can positively impact perceived stress levels, regardless of how they are delivered and positive outcomes can result from even shorter-term mindfulness interventions.

Meditation. In addition to mindfulness, meditation is another helpful tool for reducing stress that takes on an emotion-focused approach (Travis et al., 2009). Meditation is similar to mindfulness, but puts more emphasis on the physical act of focusing on the self while working to block out outside stimuli. Though there are many types of meditation, two of the more prominent practices include Transcendental Meditation and Focused Meditation. (Travis et al., 2009). Transcendental Meditation works to quiet the mind by having a person act as an observer to what is presently occurring (Tanner et al., 2009). In Focused Meditation, the individual focuses on one of the five senses while at the same time working to quiet the mind (Menezes & Bizarro, 2015). Travis et al. (2009) did a ten-week study examining the effects of Transcendental Meditation in a college student sample. Their goal was to see if meditation would have an impact on heart rate and stress levels. Students in the intervention group meditated for 20 minutes, twice a day for three months while the control group did nothing. Measurements were taken pre- and post-

test, and results indicated that the students who practiced meditation had less stress than those who did not (Travis, Tecce, Arenander, and Wallace, 2002; Travis et al., 2009;). Tanner et al. (2009) did a short-term intervention with focused meditation and found that the participants who completed the meditation reported reductions in anxiety, more positive affect, and higher attention levels, as compared to the control group who were waitlisted and did no meditation. The study did not provide information on the long-term effects of meditation.

Menezes and Bizarro (2015) examined the relationship of meditation on affect, anxiety, and attention. They found that participants who practiced meditation had a more positive affect than those who did not. Another study has also shown that mindfulness interventions have not only decreased levels of distress, but have also increased mood and that when done over time, can increase the occurrence of positive thoughts (Vinci, Peltier, Shah, Kinsaul, Waldo, McVay, and Copeland, 2014).

Research Questions and Hypothesis

Because stress in college students tends to be high, the current study aimed to examine the effectiveness of reducing students' perceived stress through a short-term meditation-based intervention. Previous research has examined the effects of meditation on reducing stress and found that interventions of various lengths have been successful at reducing stress. However, this study will explore whether or not a very brief intervention will also be effective at increasing positive affect and reducing negative affect. Using a single factor, two-group, between subject design, it is hypothesized that students who complete a guided meditation activity will report

significantly higher levels of positive affect and lower levels of negative affect, as compared to those who are not exposed to the meditation activity.

METHODS

Participants

Data were collected from a total of 106 participants, however, twelve people were dropped from data collection because they did not complete the study materials, resulting in a final sample of 94 participants. Within the sample, seven were male and 87 were female. All were at least 18 years of age and were recruited through SONA, the CSU Stanislaus Department of Psychology's online participant management system (csustan.sona-systems.com). The sample included nine freshmen, 13 sophomores, 26 juniors, and 46 seniors. The sample was composed of 20 Caucasians, two Black/African Americans, 56 Hispanic/Latinos, ten Asian Americans, one Native American/Alaska native, and five people who did not specify their ethnicity. Eighty-three participants were heterosexual, four were bisexual, and seven participants either reported "other" or declined to answer the sexual orientation question. Thirty-four participants were not currently in a romantic relationship, one was casually dating more than one person, ten were casually dating one person, 41 were in a serious relationship, one was engaged to be married, and seven were married. Forty-seven work fewer than 30 hours per week, 14 worked full-time, and 33 were not currently employed. Eleven participants had children and 83 did not at the time of the study. Each participant was given two SONA experimental credits for participating in the study, which may have been used as extra credit in a psychology course.

Materials

Demographics Questionnaire. The nine-item Demographics Questionnaire, which I created for use in this study, assessed the participants' personal characteristics, including age, gender, class level, ethnicity, and college major (see Appendix B).

Stress Survey. This survey, which I created for use in this study, includes 10 questions assessing current stress level, coping habits, and stress triggers (see Appendix C). Each participant's stress level was rated on a 1 (*low levels*)-5 (*high levels*) Likert-style response scale that prompted participants to select the choice, from the options offered, that fits them best. The coping habits portion of the survey consisted of 5 questions asking participants to report which coping habits they use to reduce their stress levels, including: social support, technology, substances, exercise, or other. It also asked if students were satisfied with their levels of support/exercise and if their stress levels were having a negative impact on their functioning. This survey was designed to provide information on attitudes towards stress, exercise, and current methods of stress reduction.

Perceived Stress Scale. The Perceived Stress Scale (PSS; Cohen, 1994) used in this study assesses an individual's perceived level of stress using 10 items (see Appendix D). Roberti, Harrington, and Storch (2006) found good internal consistency (Cronbach's alpha = .89) when analyzing its psychometrics. For the present study, an acceptable level of internal consistency was found (Cronbach's alpha = .69). Questions are designed to have participants think about instances over the course of

the past month where they have been upset, nervous, felt out of control or in control, or felt anger due to unexpected events to assess their overall stress level. Participants respond to each question using a 0 (*never*) to 4 (*very often*) response scale, with anchors appropriate for each question. Of the 10 items, four are reversed coded (4, 5, 7, and 8). Once the participant completes the questionnaire, their points are added up, with the maximum score being 40. Scores ranging from 27-40 indicate a high stress level, 14-26 indicate a moderate stress level, and 0-13 indicate a low stress level (Cohen, 1994). Previous research revealed that a majority of individuals score between 11.9-14.7 (Cohen, 1994). The PSS has been evaluated across many different categories and scores high in reliability and validity (Taylor, 2015). It also has done well when translated across 25 different languages, suggesting that it also has high cultural validity (Taylor, 2015).

Positive and Negative Affect Schedule (PANAS) The Positive and Negative Affect Schedule (PANAS) is a 20-item Likert-style response scale with two subscales designed to assess both positive and negative affect (see Appendix E) (Watson, Clark, & Tellegen, 1988). Of the 20 items, 10 are considered to be related to a positive affect (e.g., interested, inspired), and 10 are considered to be related to a negative affect (e.g., ashamed, distressed). In the current study, the pre-manipulation PANAS scores had a Cronbach's Alpha of .91 for positive affect and .89 for negative affect. The post-manipulation PANAS scores had a Cronbach's Alpha of .92 for the positive affect and .91 for the negative affect. In other studies, its internal consistency for positive affect with adults is .90 and for adolescents is .88 (Crawford, & Henry,

2004). When taking the PANAS, the participant is asked to rate their current emotions using the Likert-style scale. To score the PANAS, the scores on the positive items are added up and the scores on the negative items are added up. For the positive items, a higher score indicates more positive affect, and a higher score on the negative items indicate a more negative affect.

Guided Meditation. The script for the guided meditation, in the form of a body scan, was retrieved from UCLA's Mindful Awareness Research Center and lasted two minutes, forty-four seconds (see Appendix F). The participants listened to an audio recording of the meditation, which was recorded by the researcher. The background for the audio was a still picture of a lake with a dock. The meditation required the participant to have sound on their device in order to follow along.

Recipe. An audio recording of the researcher describing how to make zucchini bread was created for the control condition (see Appendix G). The audio consisted of the recipe instructions set to a background of a loaf of zucchini bread. This audio also lasted two minutes, thirty-three seconds and required the participant to have sound on their device in order to listen to the recipe instructions.

Procedure

Participants were recruited through SONA. Those who were interested in participating were able to access the online study materials by clicking on a link that directed them to Qualtrics. Once electronic consent was obtained, participants were given instructions about how to advance through each section, beginning with the Demographics Questionnaire. Next, participants were asked to complete the survey

assessing their current stress level, coping habits, and triggers for stress. Next, all participants completed the PSS, followed by the PANAS. After this, they were randomly assigned to either the guided meditation (experimental condition) or the zucchini bread tutorial (control condition). Those in both the guided meditation and recipe conditions condition were asked to follow along with the audio presented. Next, all participants took the PANAS a second time to rate their post-video affect level. At the end of the study, all participants were presented with a debriefing form explaining the study and their role in it.

Design

This study utilized a single factor, between subjects design to examine the effectiveness of meditation on affect. The independent variable was the video condition, with two levels, the experimental condition, in which participants were led through a guided meditation activity, or the control condition, in which participants listened to a tutorial on how to make zucchini bread. The dependent variable was the participant's level of self-reported perceived stress, or affect, which was assessed using their post-video PANAS score.

RESULTS

The results of the pre-manipulation Perceived Stress Scale analysis indicated that all participants began the study with similar stress levels. In the meditation group, participants' scores ($M = 24.9$, $SD = 6.21$, $n = 40$) reflected moderate stress levels with a range of 15 to 38. Participants' scores in the recipe condition also reflected moderate stress levels ($M = 24.8$, $SD = 5.98$, $n = 40$) with a range of 14 to 36. A t -test found no statistically significant difference in pre-manipulation perceived stress scores between the groups $t(78) = 0.073$, $p = .94$.

Independent samples t -tests were conducted to investigate whether participants who completed a guided meditation activity would report significantly higher levels of positive affect and lower levels of negative affect, as compared to those who were not exposed to the meditation activity. First, an independent samples t -test found there was no difference between the pre-manipulation positive affect scores between those in the meditation group ($M = 30.27$, $SD = 10.24$) and those in the recipe group ($M = 29.64$, $SD = 7.83$), $t(91) = 0.33$, $p = .742$. An independent samples t -test was also conducted comparing the pre-manipulation negative affect subscale scores between the groups. Data analysis revealed that pre-manipulation scores on negative affect subscale for those in the meditation group ($M = 22.87$, $SD = 9.9$) were not significantly different from the scores of those in the recipe group ($M = 23.04$, $SD = 9.42$), $t(90) = -0.085$, $p = .932$.

Finally, the post-manipulation positive affect subscale scores were subtracted from the pre-manipulation positive affect scores to get change in positive affect scores for both the meditation and recipe groups. The same procedure was used to obtain change scores for the negative affect subscale scores. Results of an independent samples *t*-test revealed that there was a significant difference in positive affect change scores between those in the meditation group ($n = 47$, $M = -1.67$, $SD = 6.1$) and those in the recipe group ($n = 45$, $M = -5.1$, $SD = 7.05$), $t(90) = 2.49$, $p = .015$. Specifically, both groups experienced a post-manipulation decrease in positive affect, however, the meditation group experienced less of a decrease, as compared to those in the recipe group. On the other hand, results revealed that there was no significant difference in change in negative affect scores between participants in the meditation group ($n = 46$, $M = -8.33$, $SD = 6.96$) and the scores of those in the recipe group ($n = 43$, $M = -7.02$, $SD = 8.2$), $t(87) = -0.811$, $p = .42$. Results from an independent samples *t*-test indicated that, while positive affect subscale scores decreased after the manipulation, the meditation group had less of a decrease in positive affect. In other words, participants in both the meditation and recipe conditions experienced similar increases in negative affect following the manipulation.

Exploratory Analyses

Of the stress reducers listed in Appendix C, 55 students marked that relationships caused them stress, 74 marked that family caused them stress, 91 marked that academics caused stress, 80 said finances caused stress, 55 felt that work

caused stress, 53 felt that their health causes them stress. They also marked difficulties sleeping ($n = 60$), difficulty eating ($n = 27$), mood swings ($n = 68$), frustration ($n = 83$), poor academic performance ($n = 40$), anxiety ($n = 77$), depression ($n = 54$), and other ($n = 6$) as implications from having stress. The likert-style responses also showed that students 4.3% ($n = 4$) of students felt “no stress,” 11.7% ($n = 11$) felt “low stress,” 1.1% ($n = 1$) was “undecided,” 40.4% ($n = 38$) felt “some stress,” 35.1% ($n = 33$) felt “high stress,” and 7.4% ($n = 7$) did not respond.

For stress reduction, participants rated exercise ($n = 59$), using technology ($n = 45$), listening to music ($n = 81$), social support ($n = 57$), alcohol ($n = 21$), drugs ($n = 12$), religion ($n = 23$), meditation ($n = 23$), food ($n = 64$), shopping ($n = 46$), and sleeping ($n = 62$), all as tools they use to reduce stress.

DISCUSSION

The goal of this study was to see whether or not a brief, online meditation intervention would have as positive effect on people as longer interventions have been shown to have done (Kettunen et al., 2014). The results provided mixed results regarding the effectiveness of the brief meditation intervention. First, as mentioned in the results section, participants in both conditions reported similar levels of pre-manipulation perceived stress. Therefore, I have evidence that the groups were experiencing similar levels of stress at the beginning of the study. Furthermore, pre-manipulation positive and negative affect scores were similar across the meditation and recipe conditions. Contrary to what I hypothesized, that participants in the meditation condition would report significantly higher levels of post-manipulation positive affect, participants in the recipe *and* meditation conditions reported a decrease in positive affect following the manipulation. However, it is important to note that those in the meditation condition did not experience as large a decrease in positive affect as those in the recipe condition.

Additionally, I tested the hypothesis that participants in the meditation condition would report lower levels of negative affect following the manipulation, as compared to participants in the recipe condition. While post-manipulation negative affect scores did decrease, neither group experienced a significant drop in negative affect. Furthermore, those in the meditation condition did not report lower post-intervention negative affect than those in the control condition, indicating that the meditation did not influence post-manipulation negative affect.

The significance associated with the change between the pre-intervention PANAS and the post-intervention PANAS suggest that using a short-term meditation can be a beneficial way to reduce stress by increasing the positive symptoms associated with affect.

Participants also completed the Perceived Stress Scale prior to the intervention, but I did not have them complete the PSS after the manipulation. Since the items on the PSS asked how often people experienced certain stressors over the preceding month, I did not expect scores on this measure to change following the manipulation. Future research may want to utilize a modified version of the PSS or another perceived stress scale that could be used to assess stress before and after the manipulation. The results of the scale were useful in measuring the stress levels prior to the interventions and confirming that participants in both groups had similar pre-manipulation stress levels.

These results are partially consistent with previous studies that examined the effectiveness of a meditation-based intervention to reduce stress (Travis et al., 2009; Travis, Tecce, Arenander, & Wallace, 2002). Reasons for non-significant results with the negative affect subscale could be attributed to an intervention that was not long enough, an intervention that was too weak, characteristics of the sample, or limitations in sample size. The guided meditation was only two and a half minutes, which might not have provided enough time for participants to reduce their negative affects. If the guided meditation had been given in-person, the results also may have been slightly different because there is less opportunity for distraction when

participants are in a controlled laboratory environment. Because the study was done online, at a time convenient for the participant, I believe that concerns about distractions are valid. Gathering responses from a larger and more diverse sample might have also provided different results. The majority of the participants were female psychology majors, which could have had an effect on the results.

In retrospect, including two groups [i.e., one in-person and one online (similar to the current study)] would have allowed me to compare the effectiveness of online and face-to-face interventions. Although I found that people in the meditation condition had a significantly lower decrease in positive affect, as compared to those in the recipe condition, the majority of the research studies examined in the literature review utilized an in-person approach. This suggests that a comparison between the two approaches might yield interesting results.

This study also only utilized participants from one university campus. By expanding the survey to another setting such as MTurk, the range of responses would likely have been more diverse, even if it was still online as opposed to in-person. The software used to capture responses failed to collect information about the ages of the participants, which is why those statistics are not reported.

Future research should include a larger and more diverse population to minimize bias. Because this study included a large sample size that was female, a future study with a more equal gender ratio could look into the difference between the two.

An additional way to conduct this research would be to have the participants take the survey in three waves: at the start of the semester, in the middle of the semester, and once more at the end of the semester. This would provide us with longitudinal data, which may reveal how perceived stress changes over time. Implementing the intervention at various points throughout the semester might yield different results based on the stress levels of the students. At the start of the semester, students are getting into the routine of their courses and coursework, which may have an impact on stress levels. The middle of the semester often includes midterms that could contribute to stress levels. At the end of the semester, many students are completing finals and essays, which are also likely to increase stress levels.

Clinical implications from this study include an ability for individuals to gain some relief after participating in a short, guided meditation. For mental health clinicians, this knowledge may be beneficial as a tool during sessions or for informing clients about the benefits of a short-term meditation. Another implication is that meditations can be accessed through the internet or a mobile device and still be successful. Individuals can utilize various resources, such as meditation Apps, podcasts, or other tools to benefit from the reduction in negative symptoms associated with stress.

In conclusion, results suggest that meditation can be a beneficial way to reduce some of the negative affects associated with stress. The present study examined some of the psychological factors of completing a meditation, including

affect and stress. Though this study only found partial significance with its' hypothesis, the information gathered can be beneficial for future research.

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APPENDICES

APPENDIX A
CONSENT FORM

1. **Summary:** This research study will examine your responses to watching a short video. If you agree to participate, you will be asked to complete a variety of surveys and watch a short video. Because the video is an important part of this study, it is necessary that you are able to both see and hear the video on your computer/smartphone.
2. **Your right to withdraw/discontinue:** You are free to discontinue your participation at any time without penalty. You may also skip any survey questions that make you feel uncomfortable. Even if you withdraw from the study, you will receive any entitlements that have been promised to you in exchange for your participation, such as experimental credit in SONA.
3. **Benefits:** Participation in this research study does not guarantee any benefits to you. However, possible benefits include the fact that you may learn something about how research studies are conducted and you may learn something about this area of research (i.e., factors that are related to how a stimulus impacts a variety of emotions and thoughts).
4. **Additional Information:** You will be given additional information about the study after your participation is complete.
5. **Time Commitment:** If you agree to participate in the study, it will take about 30 minutes to complete the survey.
6. **Guarantee of Confidentiality:** All data from this study will be kept from inappropriate disclosure and will be accessible only to the researcher, Lorraine Webb, and her faculty advisor, Dr. AnaMarie Guichard. Data collected online will be stored on a password-protected website and de-identified for analyses. The researchers are not interested in anyone's individual responses, only the average responses of everyone in the study.
7. **Risks:** The present research is designed to reduce the possibility of any negative experiences as a result of participation. Risks to participants are kept to a minimum. However, if your participation in this study causes you any

concerns, anxiety, or distress, please contact the Student Counseling Center at (209) 667-3381 to make an appointment to discuss your concerns.

8. **Researcher Contact Information:** This research study is being conducted by Lorraine Webb. The faculty supervisor is Dr. AnaMarie Guichard, PhD., Department of Psychology and Child Development, California State University, Stanislaus. If you have questions or concerns about your participation in this study, you may contact the researcher, Lorraine Webb at lwebb3@csustan.edu, or Dr. Guichard, aguichard@csustan.edu.
9. **Results of the Study:** You may obtain information about the outcome of the study at the end of the 2018/2019 academic year by contacting Lorraine Webb or Dr. Guichard.
10. **Psychology Institutional Review Board Contact Information:** If you have any questions about your rights as a research participant, you may contact the Chair of the Psychology Institutional Review Board of California State University, Stanislaus, Dr. Jessica Lambert, at PsychologyIRB@csustan.edu or (209) 667-3934.
11. **Personal Copy of Consent Form:** You may print a blank, unsigned copy of this consent form at the beginning of the study.
12. **Verification of Adult Age:** By clicking “I Agree”/signing below, you attest that you are 18 years old or older.
13. **Verification of Informed Consent:** By clicking “I agree to participate” you are indicating that you have freely consented to participate in this research study.

PARTICIPANT’S SIGNATURE: _____ DATE: _____

APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE

1. Which gender do you identify with?

Male Female Other _____

2. What year in college are you?

- a. Freshman
- b. Sophomore
- c. Junior
- d. Senior
- e. Graduate Student

3. Which of the following best describes your ethnicity?

- a. Caucasian (White/Non-Hispanic)
- b. Black/African American
- c. Hispanic/Latino
- d. Asian American
- e. American Indian/Alaska Native
- f. Native Hawaiian/Pacific Islander
- g. Other _____

4. What is your sexual orientation?

- a. Heterosexual
- b. Homosexual
- c. Bisexual
- d. Other _____
- e. Prefer not to say

5. Which of the following best describes your current employment?

- a. Part time (I work fewer than 30 hours per week)
- b. Full time (I work 30 hours or more each week)
- c. I am not currently employed

6. What is your current relationship status?

- a. I am not currently in a romantic relationship
- b. I am casually dating more than one person
- c. I am casually dating one person
- d. I am in a serious relationship
- e. I am engaged to be married
- f. I am married

7. Do you have children?

- a. Yes
- b. No

8. What is your age in years? _____

APPENDIX C
STRESS SURVEY

Instructions

This questionnaire contains 10 questions. Please read each item carefully and choose the one answer that best corresponds to the likelihood that you would experience the activity.

No Stress Low Stress Undecided Some Stress
High Stress

1. On a scale of 1 (no stress) to 5 (high stress), how stressed do you feel in your day to day life.

For the following questions, please pick the response that fits you best:

Not at all helpful Undecided Somewhat helpful
Very helpful

2. How helpful do you feel access to social support is to reducing stress?
3. How useful do you feel technology is at reducing stress?
4. How useful do you feel engaging in physical exercise is at reducing stress?
5. How satisfied are you with your current methods of stress reduction?

Unsatisfied Somewhat Satisfied Undecided Satisfied
Very Satisfied

6. Does your level of stress ever impact your level of functioning or ability to get things done?
 - a. Yes
 - b. No
 - c. Maybe
7. How likely would you be to seek out newer methods of reducing stress?
 - a. Extremely likely
 - b. Somewhat likely

- c. Neither likely nor unlikely
 - d. Somewhat unlikely
 - e. extremely unlikely
8. Mark all that apply that cause you stress:
- a. Relationships
 - b. Academics
 - c. Work
 - d. Family
 - e. Finances
 - f. Health
 - g. Other
9. Mark all that apply on the effects you feel from stress?
- a. Hard time sleeping
 - b. Hard time eating
 - c. Mood swings
 - d. frustration
 - e. Poor academic performance
 - f. Anxiety
 - g. Depression
 - h. Other
10. Mark all of the methods that you use to reduce your stress:
- a. Exercise
 - b. Technology
 - c. Listening to music
 - d. Social support
 - e. alcohol/drugs
 - f. Religion
 - g. Meditation
 - h. Food
 - i. Shopping
 - j. sleeping
 - k. None of the above

APPENDIX D

PERCEIVED STRESS SCALE

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

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

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you have confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

APPENDIX E

PANAS

Positive and Negative Affect Schedule 1

Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel these emotions right now. Use the following scale to record your answers.

	1	2	3	4	5
	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Ashamed					
	1	2	3	4	5
Interested					
	1	2	3	4	5
Determined					
	1	2	3	4	5
Strong					
	1	2	3	4	5
Hostile					
	1	2	3	4	5
Enthusiastic					

1 2 3 4 5

Inspired

1 2 3 4 5

Afraid

1 2 3 4 5

Scared

1 2 3 4 5

Proud

1 2 3 4 5

Guilty

1 2 3 4 5

Irritable

1 2 3 4 5

Active

1 2 3 4 5

Jittery

1 2 3 4 5

Distressed

1 2 3 4 5

Upset

1 2 3 4 5

Attentive

1 2 3 4 5

Alert

1 2 3 4 5

Excited

1 2 3 4 5

Nervous

1 2 3 4 5

APPENDIX F

GUIDED MEDITATION SCRIPT

Body Scan Meditation (2:44)

Begin by bringing your attention into your body. You can close your eyes if that's comfortable to you. You can notice your body, seated, wherever you're seated. Feeling the weight of your body, on the chair, on the floor. And take a few deep breaths. And as you take a deep breath, bring in more oxygen and liven the body. And as you exhale, have a sense of relaxing more deeply. You can notice your feet on the floor. Notice the sensation of your feet touching the floor. The weight and pressure, vibration, heat. You can notice your legs against the chair. Pressure, pulsing, heaviness, lightness. Notice your back against the chair. Bring your attention into your stomach area. If your stomach is tense or tight, let it soften. Take a breath. Notice your hands. Are your hands tense or tight? See if you can allow them to soften. Notice your arms. Feel any sensation in your arms. Let your shoulders be soft. Notice your neck and throat. Let them be soft, relaxed. Soften your jaw. Let your face and facial muscles be soft. Then notice your whole body present. Take one more breath. Be aware of your whole body, as best you can. Take a breath. And then, when you're ready, you can open your eyes.

APPENDIX G

ZUCCHINI BREAD RECIPE TRANSCRIPT (2:33)

In this recording, I am going to walk you through the steps of making Zucchini bread.

First, preheat your oven to 325 degrees Fahrenheit. Next, either grease, or grease and flour, two 8X4 inch pans.

Next you'll want to mix 3 cups of flour, 1 teaspoon of salt, 1 teaspoon of, baking soda, 1 teaspoon baking powder, and 1 tablespoon ground cinnamon in a bowl.

After you complete this step, get a separate bowl and combine 3 eggs, 1-cup vegetable oil, 2 1/4 cups white sugar, and 3 teaspoons vanilla extract.

Once this is all mixed well, add in the flour mixture until combined.

Next, gather your zucchini and grate enough to have two cups worth. Once this is done, add it to your mixed ingredients. Once everything is all mixed together, pour the batter into the two pre-greased pans and cook for 40 to 60 minutes.

After 40 minutes, you can use a toothpick to see if they are done. If the toothpick comes out clean, it is done. But if there is batter on it, wait a few more minutes and then recheck.

Once you are sure your breads are done, take them out of the oven and set them on a wire rack to cool for 20 minutes.

After they have cooled, you can remove them from the pans and enjoy.

APPENDIX H
DEBRIEFING SHEET

Thank you for participating in this study! I am interested in understanding the effectiveness meditation as a stress reducer. I utilized several scales to assess for current stress level both pre- and post-intervention. Previous research has found meditation and various aspects of mindfulness to be useful at lowering stress levels. I predict that participants who participate in a short, guided meditation will have lower stress levels than those who see the video with the zucchini bread.

All the information we collected in this study will be kept safe from inappropriate disclosure, and there will be no way of identifying your responses in the data archive. We are not interested in individual responses; rather, we want to look at the general patterns that emerge when all of the participants' responses are collected. We ask that you do not discuss the nature of the study with others who may later participate in it, as this could affect the validity of our research conclusions.

If you have any questions about the study or would like to learn about the results of the study, you may contact me, Lorraine Webb, through my email - lwebb3@csustan.edu or Dr. AnaMarie Guichard, at aguichard@csustan.edu.

If you have any questions about the study or would like to learn about the results of the study, you may contact me, Lorraine Webb through my research supervisor, Dr. AnaMarie Guichard, at aguichard@csustan.edu. If you have questions about your rights as a research participant, you may contact the Chair of the Psychology Institutional Review Board of California State University, Stanislaus, Dr. Jessica Lambert, at PsychologyIRB@csustan.edu or (209) 667-3934.

If participation in the study caused you any concern, anxiety, or distress, you may contact the Student Counseling Center at (209) 667-3381.