

MINDFULNESS REDUCES BEHAVIORAL PREJUDICE AND NEGATIVE EXPLICIT
ATTITUDES

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This dissertation is dedicated to my parents, my siblings, friends, and my soon to be wife. All of you have been instrumental in your influence and support throughout my life, and have allowed me to achieve anything that I have. I share this with all of you.

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ABSTRACT

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by Adam Lueke

Recent research has indicated that mindfulness meditation can decrease implicit bias against African Americans and the elderly (Lueke & Gibson, 2014). The current study looked to address the potential for mindfulness to affect prejudicial behavior as well, in addition to investigating the impact of separate dimensions of mindfulness on implicit bias. Together, 87 white participants of traditional college age were given a measure of behavioral prejudice and the race IAT, along with several questionnaires regarding trait and state mindfulness, explicit racism, and motivation to respond without prejudice. Participants were randomly assigned to three conditions before every measure except the trait mindfulness questionnaires. In all three conditions, participants listened to an audio tape as the main manipulation. The mindfulness condition listened to a woman guide them through a body scan, in which they paid attention to their thoughts and sensations in a non-judgmental, whereas two separate control conditions listened to the same audio tape, in which a woman describes a countryside landscape in England. One of the control conditions was instructed to make a mark on a piece of paper whenever a particular word was spoken, while also being told that they would be quizzed on the information in the audio tape later in the experiment. The other control condition merely listened to the audio tape. Results indicated that participants in the mindfulness condition exhibited greater state mindfulness, less behavioral prejudice, and less explicit racism than both control conditions. Implicit bias was not significantly different among the groups. Implications of the current research are discussed.

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Mindfulness Reduces Behavioral Prejudice and Negative Explicit Attitudes

“This is a revolution of the mind” – one of the most memorable quotes from the movie *Vanilla Sky* (2001) about a man who is deceived and tormented by the reality that he had created. He lived in a dream of his unconscious mind’s making, one in which he was absolutely sure of its permanence and reality, but which soon became chaotic and strange. Psychotic and alone, he was charged with the task of discovering his true nature, or else his mind’s construction would swallow him up and destroy him. The culmination of his strife led to the profound realization that his life was a lie – his world did not actually exist. With this knowledge, he chose to let go of his creation and open his eyes.

This is what the quote represents; an awakening to reality. Ultimately, through the medium of a dream, the movie juxtaposes our own personal journey toward self-discovery, one that requires us to take a step back from our experiences and understand that the way we perceive things does not necessarily represent truth. Our conscious thoughts are often automatic reactions that cling to us and misrepresent themselves as part of the self, as part of a true interpretation of the world around us, but often impair our ability to see things as they are.

The aim of mindfulness is to correct this. Through practice, the individual learns to cultivate awareness and view thoughts and feelings as transient mental events that are separate from the self, which inhibit the natural tendency toward reaction and automatic evaluation (Bishop et al., 2004). The implications are that mindful individuals are no longer beset by reactions that bias the mind or negative emotions that bind it altogether. It is kind of like counting to 10 for the angry individual before doing something rash, but with purposeful intention to separate the self from the reaction or negative emotion and observe it rather than hope it begins to dwindle. This ability comes from an awareness of the body and mind that is

inherent within the mindfulness practice (Kabat-Zinn, 2005). As Kabat-Zinn (2003) puts it, mindfulness is “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.” This subsequently allows the individual to become more objective and understanding of the moment or current situation while remaining relatively unscathed by the reactive nature of the mind which tends to skew reality in an egocentric and biased way. However, the awareness and unreactive nature created by mindfulness have far reaching benefits beyond that of objectivity and attention. Mindfulness research has flourished in recent years, especially in the clinical domain in which it has been incorporated into several types of therapies, most notably Mindfulness Based Cognitive Therapy (MBCT) and Mindfulness Based Stress Reduction (MBSR). These therapies, among others, have been central in the examination of the effect of mindfulness on individual health, weight management and dieting, and most frequently for what mindfulness is best known for bringing about: well-being.

Ultimately, the current research is focused on the impact of mindfulness on implicit attitudes, and how the ability of mindfulness to reduce the automaticity of the mind contributes to a reduction in implicit bias. To understand how mindfulness can lead to greater control over the mind with less automaticity, it is important to get a better sense of what mindfulness is, what it is used for, and how it can improve people’s lives in terms of overall well-being, physical health, and even weight management before returning to a specific consideration of cognitive functioning.

Literature Review

Well-Being

Probably the most common conceptualization of mindfulness is that of an individual with eyes closed and legs crossed, humming the “ohm” sound while peacefully clearing the mind of any distractions and embracing a satisfaction of life the way it is. It is not of someone stressing over the to-do list for the day, or ruminating about a confrontation they had with another person. Anxiousness, stress, and other negative emotional forms are thought to melt away during the mindfulness process, which seemingly should have many positive and long lasting psychological benefits. But it is not only those who regularly meditate that receive these benefits, but also those whose personalities reflect the awareness and non-reactivity central to the mindful practice. This is termed “trait mindfulness” or “dispositional mindfulness”.

In the first investigation of how trait mindfulness relates to psychological well-being using the Mindful Attention Awareness Scale (MAAS), Brown and Ryan (2003) correlated it with a host of other trait scales. They found that individuals higher on trait mindfulness show lower levels of trait neuroticism, depression, self-consciousness, angry hostility scales, and impulsiveness scales. These people also showed less anxiety, more positive affectivity, less negative affectivity, greater life satisfaction, higher self-esteem, more subjective vitality, autonomy, competence, relatedness fulfillment, and even greater self-actualization. Furthermore, in a second study they found that individuals who practice meditation scored higher on the MAAS than did individuals who do not practice, lending validity to the scale itself. Using the scale again in a third study, Brown and Ryan (2003) used experience sampling to determine that individuals who scored higher on the MAAS had fewer day to day unpleasant affective

experiences and greater engagement in autonomous activity, and those who showed higher levels of state mindfulness (taken by using five reworded questions from the MAAS to measure current mindfulness), exhibited greater autonomy, more frequent and longer lasting positive affect, and less frequent and shorter instances of negative affect. Their following study indicated that higher levels of mindfulness measured by the MAAS related to lower levels of mood disturbance and stress in hospital patients diagnosed with cancer. Even more convincing was that the mood disturbances and stress decreased over time as mindfulness increased over the course of an eight week mindfulness intervention program.

In support of the findings that people higher on trait and state mindfulness show higher levels of well-being, Prazak et al. (2012) found correlational evidence that indicated that individuals with higher trait mindfulness showed greater levels of emotional and psychological well-being, as well as less negative affect and social inhibition. Much of what is measured in trait mindfulness scales is the tendency to pay attention to the task at hand and not allow the mind to wander to some other topic, and research has shown that mind wandering leads to lower levels of reported happiness (Killingsworth & Gilbert, 2010). People who are depressed tend to struggle with recalling the details of personal experience (which could be indicative of a wandering mind that lacks focus on the present) and show lower levels of meta-awareness, but research has shown that mindfulness training can not only make those struggling with depression better able to recall events as they happened more accurately, but also view events and thoughts in a decentered way that allows a separation of the individual from negative content (Hargus, Crane, Barnhofer, & Williams, 2010). The ability to decenter and therefore separate the self from the negative content of the mind and refrain from internalizing unfortunate events as though

they were deserved likely decreases the amount of anxiety an individual suffers on a regular basis. Indeed, children who exhibit chronic levels of anxiety have been shown to significantly improve and show less anxiety after a mindfulness based intervention (Lagor, Williams, Lerner, & McClure, 2013).

Stress is often at the forefront of anxiety, and research has shown that mindfulness based programs that are designed to reduce stress are considerably effective in the treatment of anxiety disorders. Individuals with Generalized Anxiety Disorder and Panic Disorder have shown decreases in overall depression and anxiety scores as well as panic symptoms after an eight week group mindfulness based stress reduction intervention. These reductions in symptoms were maintained three months after the intervention had concluded (Kabat-Zinn et al., 1992), as well as after a three year follow up with these same patients – most of whom had continued their mindfulness meditation practices (Miller, Fletcher, & Kabat-Zinn, 1995). Baer, Carmody, and Hunsinger (2012) also showed that individuals who underwent MBSR for an eight week period increased their overall level of mindfulness, which preceded a significant reduction in their overall level of stress. In fact, MBSR has even been shown to be effective in decreasing levels of hostility and mood disturbances while increasing self-esteem in prisoners (Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007).

The impact of mindfulness on well-being also extends into the feeling of individual satisfaction or accomplishment. Research has shown that workers at various organizations who reported job satisfaction and emotional exhaustion over a five day period showed that higher levels trait mindfulness measured by the MAAS and state mindfulness using rephrased questions from the MAAS correlated with greater job satisfaction, less emotional exhaustion, and less

“surface acting”, which is the tendency to have a strong negative evaluation and internal reaction to an event that needs to be suppressed (Hulsheger, Alberts, Feinholdt, & Lang, 2013). In fact, the follow up also indicated that individuals who underwent a mindfulness intervention program reported higher job satisfaction, less surface acting, and less emotional exhaustion. Collard, Avny, and Boniwell (2008) discovered that students who underwent MBCT showed greater levels of mindfulness than they had before the program, along with significantly less negative affect, and a nearly significant increase in life satisfaction ($p = .052$). Research regarding stress and burnout in workers in the healthcare profession has indicated that an eight week MBSR course significantly improved scores on measures of Mental Health, Emotional Exhaustion, Depersonalization, and Personal Accomplishment (Goodman & Schorling, 2012). It seems as though mindfulness techniques have a re-energizing quality that allows individuals to take a step back and appreciate the lives that they have and the work that they do.

In light of the abundance of research demonstrating the positive effect of mindfulness on psychological well-being, research has begun to attempt to tease apart the mindfulness practice in order to understand what components are responsible for these improvements. In researching the neurological substrates that underlie mindfulness, Davidson et al. (2003) found that individuals who underwent an eight week MBSR program reported significantly less anxiety immediately after the program than their baseline report, along with decreased negative affect immediately after the program as well as four months later. Furthermore, EEG and EOG results indicated that individuals who had gone through the program showed increased activation in brain regions associated with positive affect up to four months after the program had finished.

Research regarding trait mindfulness in adolescents underscores rumination as a potential contributor to increased stress and lower psychological well-being. It was discovered that lower levels of trait mindfulness were associated with higher levels of dysphoric mood, along with greater vulnerability to the effects of stress, which was mediated by an overall greater tendency toward rumination (Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012). It seems as though individuals that experience more stress often do so through their rumination of the problem, which is subverted in those that possess greater mindfulness.

In addition to this, and of particular importance to the current study, attention and psychological flexibility also appear to play integral roles in the improvements seen through mindfulness interventions. Psychological flexibility includes learning to accept the current state of circumstances, regardless of whether they are positive or negative, and committing to behavior that represents the individual's genuine values. This psychological flexibility has been shown to increase in participants who underwent mindfulness based Acceptance Commitment Therapy (ACT) at three months after the treatment had ended, and this increase mediated significantly positive increases in mental health (Fledderus, Bohlmeijer, Smit, & Westerhof, 2010). As for attention, research has shown that MBSR increases general levels of attention from pre to post intervention comparably with that of a non-meditation based stress reduction program or financial incentives over that of a control group, but was significantly better than all other groups regarding enhanced selective attention, while also improving participants' threshold of conscious visual perception and working memory capacity. Furthermore, participants' self-reported stress and measured cortisol levels were significantly decreased after MBSR, while their mindfulness levels had significantly increased (Jensen, Vangkilde, Frokjaer, & Hasselbalch,

2012). Consequently, it could be that improved psychological flexibility and attention may be at the forefront of the general positive changes of mindfulness interventions. This possibility will be discussed in more detail later.

Overall, the effectiveness of mindfulness based interventions to relieve stress and improve well-being has tremendous potential for the alleviation of physical symptoms and the improvement of individual health, as well as potentially having a powerful impact on individual sense of meaning in life. In fact, research has shown that MBSR significantly increases individual spirituality, along with trait and state mindfulness and decreased psychological distress and even reported medical symptoms. Furthermore, improvements in trait mindfulness and spirituality were associated with the diminished psychological distress and medical symptoms (Carmody, Reed, Kristeller, & Merriam, 2008). This enhanced spirituality through meaning and non-religious faith could possibly explain the positive impact of mindfulness on job and life satisfaction cited earlier, while the improvement in reported medical symptoms could be the result of mindfulness' repeatedly demonstrated impact on stress reduction. It appears that mindfulness may be able to heal the practicing individual in more than just the psychological and emotional domains.

Physical Health

An important place to begin when looking at the effect of mindfulness on health is to determine its impact on health related behaviors. Research with college women has indicated that high trait mindfulness was associated with superior health related behaviors, such as higher sleep quality, better eating habits, and more frequent exercise behavior over the course of a 10 week period. In addition, trait mindfulness measured at the beginning of the study was

associated with physical health at the end of the study significantly beyond what was predicted by the health related behaviors (Prazak, Critelli, Martin, Miranda, Purdum, & Powers, 2012). Furthermore, Roberts and Danoff-Burg (2010) performed correlational analyses relating mindfulness, stress, overall health, and a variety of health related behaviors. They discovered that higher levels of trait mindfulness were associated with better sleep quality and eating habits, as well as lower stress. It also correlated with more physical activity, fewer days missed of school or work due to mental or physical issues, and better perceptions of overall health. In addition, the Awareness subscale within the overall mindfulness scale indicated that higher levels of mindful awareness were correlated with less cigarette smoking and fewer sexual partners. Of particular interest was that stress acted as a partial mediator between mindfulness and sleep quality, eating habits, overall health perception, physical activity, and the number of days of missed school or work. This suggests that individuals with higher trait mindfulness experience less stress, which results in better overall health behaviors and therefore better overall health. The effectiveness of the MBSR (among other mindfulness based interventions) in decreasing stress and increasing mindfulness would then also likely encourage better health behaviors and overall health as well.

Correspondingly, research has demonstrated that an MBSR intervention used in a patient population improved health related quality of life and physical symptoms on a host of self-report scales, while also decreasing psychological distress. A one year follow up revealed that a majority of the original patients continued to practice mindfulness regularly, and the majority of the initial improvements in health and quality of life that were observed immediately after MBSR had been maintained (Reibel, Greeson, Brainard, & Rosenzweig, 2001). Brown and

Ryan (2003) found correlational evidence that supported this as well, with individuals higher in trait mindfulness reporting fewer physical symptoms. In examining its confluence with the concept of forgiveness, research has indicated that the tendency to forgive the self, others, and situations can lead to overall better physical and mental health through its association with trait mindfulness (Webb, Phillips, Bumgarner, & Conway-Williams, 2013).

Despite the improvement of overall physical health and health related behaviors through mindfulness, the majority of individuals often have to endure pain at some point in their lives. The effect of mindfulness on pain regulation and the ability to endure pain have been examined more in recent years after it was initially encountered in the literature nearly three decades ago. At that time, Kabat-Zinn, Lipworth, and Burney (1985) found that a 10 week mindfulness stress reduction and relaxation program for individuals dealing with chronic pain significantly improved a variety of pain and psychological symptoms, including measures of current experiences of pain, activity restriction due to pain, negative body image, anxiety, and depression, whereas a control group did not show levels of improvement over this time span. Fifteen months after training, the majority of the improvements had been maintained, and most of the patients continued to engage in regular meditation. Similarly, Hawtin and Sullivan (2011) interviewed individuals with rheumatic disease that underwent MBSR in order to help cope with the pain of their affliction. From the self-reports, the authors determined that the MBSR program was extremely well-received by the patients, who reported drastic increases in overall well-being, ability to deal with and respond to pain, and an overall increase in the desire and ability to function in everyday life.

This ability to function in everyday life and to not become overwhelmed with the experience of pain is a common theme in the mindfulness literature. Research with female endometriosis patients has demonstrated that a mindfulness intervention pain program significantly decreased experiences of pain, while increasing well-being and ability to function in everyday life, which remained true after a one year follow up (Kold, Hansen, Vedsted-Hansen, & Forman, 2012). An eight week mindfulness intervention for elderly individuals with chronic lower back pain indicated that they improved significantly on scales of physical functioning, pain acceptance, and in the engagement of activities in their daily lives (Morone, Greco, & Weiner, 2008). Importantly, it seems as though it may be the perceived control over pain and not an actual decrease in the pain itself that is at the heart of the improvements seen in these populations. As one of the main purposes of mindfulness, awareness of current experiences would seemingly make the individual who experiences pain focus and pay attention to the experience while accepting it, rather than try to avoid or escape from it. Brown and Jones (2013) examined a mindfulness based pain reduction program compared to a control group for individuals who were experiencing chronic musculoskeletal pain. Results revealed that the mindfulness intervention significantly improved patients' well-being, as well as their perception of control over pain and engagement of pain self-management. Furthermore, the improvements in mental health were predicted by pain self-management and perceptions of pain control, and not related to any significant reduction in clinical pain ratings themselves. In addition, all participants were subject to experimentally induced pain before and after the eight week time period, and results indicated no significant difference between the mindfulness intervention and control conditions in terms of pain ratings. However, EEGs revealed that the mindfulness intervention condition exhibited a

significant decrease in brain activity during the anticipation and experience of pain relative to the control group in brain regions associated with the experience of emotion rather than intensity of pain, while brain regions associated with executive function increased in activity. This indicated that the emotional correlates that normally accompany pain were decreased for the mindfulness group, while the abilities to anticipate pain, control the experience of it, and accept it were improved. Individuals who undergo mindfulness training are then likely to experience pain intensity in much the same way, but can overcome the feelings of helplessness that tend to come with it and therefore take back charge of their lives.

Furthermore, there does seem to be potential optimism for the remediation of physical health problems through the use of mindfulness. In fact, research has shown significant health improvements that have been the result of mindfulness interventions. Patients with psoriasis who were undergoing light therapy to clear up their condition healed at a significantly faster rate when concomitantly listening to MBSR audio tapes than patients who underwent the same therapy without the mindfulness intervention (Kabat-Zinn et al., 1998). Brain regions associated with positive affect, emotional regulation, and adaptive responding were demonstrated to increase in activation for individuals who underwent an MBSR program as opposed to controls that did not experience increased brain activation, while the number of antibody titers from pre to post test significantly increased for the mindfulness group in response to an influenza vaccination as opposed to controls who revealed no such increase. Furthermore, the increase in brain activation was predictive of the magnitude of the antibody increase (Davidson et al., 2003). These studies indicate that mindfulness can not only improve psychological well-being through

an alteration on actual brain activation, but that this can result in improved immune functioning and the potential hastening of the healing process.

Research has also indicated that mindfulness has a significant impact on cardiovascular health. Correlational research indicated that higher trait mindfulness was strongly associated with an overall better level of psychological well-being, along with a well-established measure of cardiovascular health assessed through electrocardiograph (EKG) (Prazak, Critelli, Martin, Miranda, Purdum, & Powers, 2012). Matchim, Armer, and Stewart (2011) found that women who had previously been diagnosed with breast cancer showed significant improvements in pre to post measures of mindfulness, heart rate, blood pressure, respiratory rate, and cortisol levels after an MBSR program in comparison with a control group. Goodwin and colleagues noted that the majority of cardiovascular issues can be avoided if at risk individuals would simply modify problematic health behavior – though most do not do so despite the recommendation. They used an Acceptance Based Behavior Therapy program focused on mindfulness on at risk cardiac patients in order to increase adherence to behavioral recommendations made by cardiac specialists and found significant decreases from pre to post test on measures of caloric, fat, and sodium intake, as well as overall weight and BMI, while increases in physical activity were also observed. Results indicated that it was psychological improvements of the intervention, such as acceptance and awareness, that were likely responsible for the positive changes in the patients (Goodwin, Forman, Herbert, Butryn, & Ledley, 2012).

These improvements in cardiovascular health deserve serious consideration for a country in which heart disease is the number one risk of death. The obesity epidemic is, in large part, to blame for this trend, and the vast number of diet and workout plans that constantly sprout up

indicate a lack of understanding and ability for people who are trying to lose weight to follow through. If mindfulness interventions can become commonplace in educating overweight individuals about cardiovascular health and the at-risk behaviors that deteriorate it, then these individuals may be able to effectively improve their health while managing their weight through awareness and a newfound ability to control negative impulses.

Diet/Weight Management

Some individuals have to deal with physiological struggles that hinder their ability to manage their weight. In a case study that charted efforts to help an obese adolescent male name Jason with Prader – Willi syndrome (substantially delayed satiety response) and a learning disability better regulate his diet and manage his weight, Singh et al. (2008) evaluated his progress using three different programs. These programs were instituted sequentially, starting with only regular exercise, then moving to healthy eating through food awareness and regular exercise, before finally attempting a program that combined the previous two programs with mindfulness techniques. While the exercise alone and healthy eating and exercise conditions helped him to slightly manage his weight, when combined with mindfulness techniques such as mindful eating and visualization of hunger or attention shifting, the results were far more significant, and he began to consistently lose weight and use the mindfulness techniques for a sustained period of time, even when observed again every three months for the period of three years. Jason steadily was able to lose over 60 pounds during that time period.

This case study gives an interesting perspective into the efficacy of mindfulness in maintaining a healthy lifestyle, especially in terms of one's relation to food. Much of what plagued Jason was the unending hunger that he felt due to his diagnosed satiety disorder, but

much of the problem for many individuals struggling with their weight is intense food cravings that become overwhelming until they are acted upon. Research with an adult obese population set out to determine the effectiveness of mindfulness techniques on decreasing these food cravings and allowing them to gain control over their eating habits (Alberts, Mulkens, Smeets, & Thewissen, 2010). Results indicated that an experimental group that underwent mindfulness training based on awareness of bodily sensations and acceptance of sensations as transitory, in addition to an exercise and health eating information regimen, significantly decreased food cravings and the feelings of loss of control when confronted with food cues, whereas a control group who only were exposed to the exercise and healthy eating information regimen over the same period of time did not report any reductions in food cravings or loss of control when exposed to food cues. In support of this, Alberts, Thewissen, and Raes (2012) examined the effect of a mindfulness eating program compared with a waiting list control on individuals with disordered eating behavior. Their results indicated that participants in the mindfulness eating program significantly reduced their eating in response to external food cues and labeling food as “good” or “bad”, experienced decreased food cravings and emotional eating, and also developed a significantly more positive body image, whereas control group participants experienced none of these improvements.

Furthermore, research has also indicated that trait mindfulness substantially contributes to the ability to overcome the desire to eat unhealthy food when exposed to food cues as measured by brain activation through fMRI. Research with obese adults indicated that individuals high in trait mindfulness showed brain activation that returned to a normal resting state after exposure to words representing their favorite foods that they were asked to fully visualize, whereas

individuals low in trait mindfulness indicated brain activity that fixated and elaborated on the food cues even when they were no longer exposed to the favorite food word. Importantly, high and low trait mindfulness groups did not differ in terms of hunger or state craving ratings (Paolini, Burdette, Laurienti, Morgan, Williamson, & Rejeski, 2012). This, like the pain research, indicates that it is not a reduction of the experience that leads to improvements in dealing with particular struggles of sensation, but rather increased awareness and acceptance of the sensation that gives rise to a better sense of health and well-being.

Interestingly, research has demonstrated that implicit reactions toward unhealthy food can be modified and eliminated within individuals. Papiés, Barsalou, and Custers (2012) had participants view a series of pictures representing either healthy or unhealthy foods that were centered within a colored frame – the color of the frame determined whether the participant should approach the food (with the up arrow key) or avoid the food (with the down arrow key). This was an approach task to determine food preference after an initial training period viewing the same pictures. During a training period, individuals in the mindfulness condition were told to examine their reactions to pictures of unhealthy food, and to understand and observe these thoughts and feelings as transient mental states. Over the course of three different experiments, results demonstrated that individuals who viewed pictures and their subsequent thoughts as transient mental states showed no approach bias toward unhealthy but appetizing looking food during the approach task (there was a slight but non-significant bias toward neutral food), whereas control participants indicated a significant approach bias toward unhealthy food. This effect remained even after a five minute distraction period after participants viewed the initial pictures of the food during the training period and before the approach task. This indicates that

mindfulness can not only help an individual overcome uncomfortable bodily sensations, but can also work to subvert automatically activated impulses before they can negatively interfere with the individual in the first place. This means that mindfulness could help alleviate certain implicit responses or cognitive biases that constrain an individual's thinking and potentially open their mind to greater cognitive abilities.

Automaticity and Implicit Attitudes

An important part of expanding the mind to new possibilities is through creativity – a new way of thinking about things that doesn't rely on solutions from previous experience. However, often times previous experience causes automatically activated verbal-conceptual processes that bias the mind toward a response and restrict it from other possibilities. This process and its amelioration was demonstrated by research regarding insight problem solving (Ostafin & Kassman, 2012). Insight problem solving requires a restructuring of information in creative ways that can eventually lead to the correct answer. Often times individuals rely too heavily on the problem solving strategies or biases of information that automatically spring to mind upon reading the problem. Mindfulness, on the other hand, has as its goal an awareness of the present, which relinquishes the mind's fixation on automatically activated past experience. This can then allow the individual to view the world in a non-biased and more objective manner. Over the course of two studies, Ostafin and Kassman (2012) found that individuals that were either higher on trait mindfulness or who underwent a short 10 minute guided meditation performed significantly better on insight problems than did those either low in trait mindfulness or who did not get the short guided meditation. Furthermore, state mindfulness partially mediated the relationship between the guided meditation and improved insight problem solving.

These results indicate that mindfulness has a substantial influence over the general automaticity of cognition and subsequent responses.

One consequence of the results that mindfulness can disrupt automatically activated biases, cognitive strategies, and unconscious behavior is that implicit attitudes may potentially be changed as well. Previous research regarding mindfulness and automatic association or prejudice has not looked at the impact of mindfulness on attitudes. Considering that implicit attitudes have been shown to be more predictive of certain types of behaviors than explicit attitudes, such as discrimination in hiring practices (Zeigert & Hanges, 2005), the subtle friendliness of body language (McConnell & Leibold, 2001), or even the evaluations of trustworthiness (Stanley, Soko-Hessner, Banaji, & Phelps, 2011), the importance of influencing implicit attitudes to become more positive and less biased should not be understated. These results are relevant to the current research, as is the consistent finding that race related stimuli activates automatic stereotypes (Casper, Rothermund, & Wentura, 2010; Devine, 1989; Bargh, Chen, & Burrows, 1996; Payne, Lambert, & Jacoby, 2002; Payne, 2005). These automatically activated associations are often measured as implicit attitudes with the Implicit Associations Test (IAT), which uses reaction time to determine the strength of associations between categories. Research has shown that white individuals who take the race IAT tend to show stronger associations between good things with white faces than with black faces, and of bad things with black faces than with white faces (Dasgupta, McGhee, Greenwald, & Banaji, 2000; Greenwald, McGhee, & Schwartz, 1998; McConnell & Leibold, 2001; Monteith, Voils, & Ashburn-Nardo, 2001).

However, research does suggest that the race IAT is malleable (Ito, Chiao, Devine, Lorig, & Cacioppo, 2006; Richeson & Ambady, 2003; Sassenberg & Moskowitz, 2005; Sinclair, Lowery, Hardin, & Colangelo, 2005; Olson & Fazio, 2006; Dasgupta & Greenwald, 2001; Devine, Forscher, Austin, & Cox, 2012), which means that implicit attitudes can be changed under the right circumstances. Given the abundance of research indicating that mindfulness can disrupt that automatic activation of concepts, thoughts, or biases, it appears plausible that it could influence and change implicit attitudes as well as their effects. Recent research suggests that this is true, as the relationship between implicit alcohol attitudes and drinking behavior was significantly weakened after brief mindfulness training, whereas problem drinkers in a control condition showed strong associations between implicit attitudes and drinking behavior (Ostafin, Bauer, & Myxter, 2012).

Furthering this assumption, research has indicated that mindfulness based intervention programs can decrease habitual responding that is automatically activated through the Stroop Task and through a prospective memory task, compared to controls who showed no reduction in automatic responding (Wang, Xin, Liu, Zhang, Lu, & Zhai, 2012). While the insight problem research demonstrates that automatically activated strategies and problem solving can be subverted through mindfulness in order to pave the way toward a solution through conscious processes, the Stroop and prospective memory findings indicate that quick reaction time based judgments in which the individual does not have time to think also can be de-automatized to affect implicit attitudes. Case in point, Lueke and Gibson (2014) found that individuals who underwent a 10 minute guided meditation displayed significantly less racial bias on the race IAT

than did participants who merely listened to a 10 minute audiotape describing an English countryside.

This de-automatization and reduction in implicit attitudes can potentially have important effects on behavior as well, as can be seen through research on stereotype activated behavior. Djikic, Langer, and Stapleton (2008) primed participants with the concept of old age while varying the amount of mindfulness that participants engaged in. Results indicated that the more individuals had engaged the concept of old age with mindfulness, the faster they walked to the elevator after being dismissed from the experiment. In other words, the more mindful that individuals were, the less affected they were by automatically activated stereotype congruent behavior. This has potentially major implications for the reduction of prejudice based on automatically activated stereotypes or biases. In fact, Langer, Bashner, and Chanowitz (1985) revealed that mindfulness training in children (related directly to increasing awareness of the aspects of a particular physical handicap) actually resulted in less avoidance of handicapped children.

Importantly, however, this research regarding mindfulness and automatically activated stereotype congruent behavior (Djikic, Langer, & Stapleton, 2008) and prejudice (Langer, Bashner, & Chanowitz, 1985) used mindfulness manipulations that focused directly on the outgroup in question, whereas the results from Lueke and Gibson (2014) found a reduction in implicit attitudes using a general mindfulness manipulation that did not relate directly to race at all. This could indicate that the general practice of mindfulness has overarching benefits without any design to utilize it as an intervention for a particular purpose; it may just naturally be effective in several seemingly unrelated domains. Given this finding, the current research is

focused on determining what aspects of mindfulness are responsible for this change in implicit attitudes, and whether changes in implicit attitudes mediate the relationship between mindfulness and subsequent behavioral changes.

Dimensions of Mindfulness

The current mindfulness literature has been trying to tease apart the mindfulness construct into its components. Baer and colleagues have found evidence for up to five different facets (observing, describing, acting with awareness, non-judging, non-reactivity) that could exist under the mindfulness umbrella (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Cardaciotto, Herbert, Forman, Moitra, and Farrow (2008) characterized present moment awareness (observing) and acceptance (non-reactivity) as the two main components of the mindfulness construct. These components are separate and distinct, as shown by results indicating mindfulness scales that measure observing and non-reactivity predict different things (Anicha, Ode, Moeller, & Robinson, 2012). According to Kabat-Zinn (2005), the observing dimension is cultivated through mindfulness meditation by paying attention to aspects of the present moment and observing sensations related to it. This can be done by examining the breath and its properties, such as the feeling of pressure in the lungs, or the temperature of the air moving into and out of the nostrils, through other proprioceptive feedback, such as a focus on the sensation of how the floor impacts the feet, or by focusing on objects in the external environment, like the way each individual leaf on a tree moves with the wind. This concentration can then be turned inward toward the thoughts and feelings of the mind. At this point, the individual accepts whatever drifts into the mind and attempts to let it fade without attaching to it. Through practice, a division between thoughts and reaction takes place, and a space between them now exists. This

allows the individual to become non-reactive, which can be demonstrated by mindfulness' significant relationship to cognitive flexibility (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007).

In testing the difference between these two trait components of mindfulness and how they influence certain cognitive abilities, Ruocco and Direkoglu (2013) used trait mindfulness subscales of present moment awareness (observing) and acceptance (non-reactivity) to discover that present moment awareness correlated significantly with a well-established measure of sustained attention (CPT-II) but not with a measure of working memory capacity, while acceptance correlated significantly with working memory capacity and sustained attention. However, the correlation of sustained attention with acceptance was not nearly as strong as with the present moment awareness scale. In support of this, research also found that a measure of perceptual attention that did not require working memory correlated significantly with the observing but not the non-reactivity facets of mindfulness, while a measure of cognitive flexibility correlated significantly with the non-reactivity but not observing mindfulness facet scales (Anicha, Ode, Moeller, & Robinson, 2012). This indicates that mindfulness differentially affects perceptual abilities, characterized by attention to one's sensations and experiences through awareness, and cognitive control flexibility, characterized as acceptance of environmental demands allowing strategy and thought shifting. Anicha et al. (2012) described the two dimensions as "perceptual" and "postperceptual".

The non-reactivity dimension as measured by cognitive flexibility seems likely to have played a significant role in the results found by Ostafin and Kassman (2012), in which they discovered that individuals with either higher trait or state mindfulness exhibited greater ability

to solve insight problems, which involved a restructuring of information and the disengagement of previously learned problem solving strategies. They described the higher mindfulness group as showing greater “creativity”, which appears accurate considering the results by Zabelina and Robinson (2010) indicating that greater cognitive control flexibility predicted greater levels of creativity. Furthermore, it has directly been shown that mindfulness interventions significantly increase cognitive flexibility (Fledderus, Bohlmeijer, Smit, & Westerhof, 2010).

The observing dimension as measured by perceptual abilities seems likely to have played its role in the results found by Jensen, Vangkilde, Frokjaer, and Hasselbalch (2012), in which they revealed that individuals who underwent MBSR exhibited greater visual perceptual ability, and selective attention. Both dimensions likely exerted their effect on results regarding mindfulness and GRE performance, in that individuals that underwent mindfulness training significantly improved reading comprehension GRE scores along with working memory, which were mediated by less mind wandering and fewer distractions in individuals during testing (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). However, the association of these results with one dimension or the other is speculation based on the previous research, because mindfulness interventions do not usually target one dimension or another.

Current Study

The goal of the current research is to not only demonstrate that a mindfulness intervention improves both of these facets, but to understand how each of them differentially affects a measure of implicit racial attitudes. As noted before, research has shown that a short mindfulness intervention significantly decreases racial bias as measured on the race IAT (Lueke & Gibson, 2013). However, it is not known how the short mindfulness intervention affects the

observing or non-reactivity facets of mindfulness, or subsequently how the change in either of these facets may contribute to the reduction of implicit bias. Given the nature of the IAT, I hypothesize that the reduction of implicit racial attitudes is mediated by the combination of both factors, and that if either facet is eliminated the effect will disappear. It seems likely that the perceptual ability based on cues related to the identification of race based on skin color and the derivation of positive or negative meaning through word reading is enhanced and therefore contributes to faster reaction time. It also seems likely that individual cognitive flexibility is increased, resulting in less engagement with past associations, which leads to less difficulty with categorization that doesn't correspond with these associations, and therefore improved efficiency and ability to react specifically to the changing demands of the IAT, regardless of what association is asked to be made. Consequently, it is the coordination of these two facets of mindfulness, each with their own unique contribution, which unshackles the mind of implicit racial bias.

In addition, given that less implicit racial bias is associated with lower levels of certain types of prejudiced behavior (McConnell & Leibold, 2001; Stanley et al., 2011; Zeigert & Hanges, 2005), increasing mindfulness should lead to a reduction in these behaviors as well. I then hypothesize that individuals who undergo a brief mindfulness intervention will not only show significantly less biased implicit racial attitudes, but also less prejudiced behavior on an implicit evaluation of trustworthiness task (Stanley et al., 2011) when compared with a control condition. Furthermore, given the evidence that mindfulness improves GRE scores through decreasing distraction and mind-wandering (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013), it is important to ensure that it is not the act of paying attention itself that makes

mindfulness effective. Rather, it is more likely the observing and non-judgmental aspects that mindfulness cultivates that is responsible for any ameliorative effects. Therefore, I hypothesize that the mindfulness condition will not only show decreased prejudice when compared to a control condition, but also to a second control condition in which participants are required to pay attention to the material they are exposed to. As a whole, the mindfulness condition should show less prejudice than both of the control conditions combined as well. This is the first study to investigate the role of separate mindfulness dimensions in the expression of implicit attitudes, and in the potential of a brief and general mindfulness manipulation to reduce prejudicial behavior through reduced implicit bias. Specifically, I hypothesize the following:

1. Mindfulness will reduce bias on the race IAT
2. Mindfulness will increase self-reported Observing and Non-Reactivity
3. If the results from either Observing or Non-Reactivity are eliminated, the IAT effect will disappear, consistent with mediation by mindfulness
4. Mindfulness will decrease prejudice in the Trust Game task
5. Implicit racial attitudes will be predictive of prejudice
6. Self-reported Observing and Non-Reactivity will be predictive of prejudice.

Method

Participants

Individuals signed up through Sona-Systems at Central Michigan University, and were given course credit for their participation. The design was a 3(between: pure control x control attention x mindfulness) by 2(within: rating black and white faces) mixed factorial design. There was a total of 87 white participants (32 men and 55 women) after some participant data was

excluded. Of the excluded data, 26 participants' data were eliminated due to using a rule-based strategy during the Trust Game (e.g. giving \$10 to every interaction partner). While this may seem like a lot, it is less than the proportion of individuals eliminated (.23) than has been done in previous research using this game (.25) (Stanley et al., 2010). In addition, five participants were eliminated for failing to follow directions (e.g. skipping the audio section), and six were excluded due to their extreme values beyond two standard deviations away from the mean in the Trust Game.

To ensure that the correct number of participants' data were removed due to outliers, another statistical procedure was used that has been deemed a much more appropriate and robust method to eliminate outliers – one which uses the Median Absolute Deviation (MAD) (see Leys, Ley, Klein, Bernard, & Licata, 2013). In this method, the median of the sample is first found, and then is subtracted from each participant's score. The absolute value is taken of each score, and the median of these scores is then obtained. This new median is then multiplied by a constant (1.4826), which assumes the data follows a normal distribution when outliers are eliminated. Once this new value is obtained, it is then multiplied by a critical rejection value determined by the researcher. The three proposed values are 3 (extremely conservative), 2.5 (moderately conservative), and 2 (poorly conservative). Of these choices, 2.5 is the recommended choice (Leys et al., 2013). After this value is obtained, it is separately added to and subtracted from the original median of the sample to produce the range of data that should be accepted. Any data outside of this range is then eliminated as an outlier.

In terms of the current study, the median of 17 was obtained from 93 participants. This was then subtracted from each participant's score, and absolute values were created from those

scores. The new median obtained was 31, which when multiplied by the constant produced the value 45.96. This value was then multiplied by the recommended critical value of 2.5, to produce a total of 114.90. To determine the range of acceptable data, this total was then added to and subtracted from the original median of 17, to produce the range of -97.90 to 131.90. All values outside of this range were discarded as outliers. Data from six participants was discarded in this way – the same six that were discarded by using two standard deviations from the mean.

Procedure

Participants were run one to three at a time and seated at private workstations that contained computers equipped with the MediaLab software and a set of headphones. When they were ready, participants were given questions from the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001) and Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005) that represent the Non-Reactivity dimension of mindfulness and questions from the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) and the FMI that represent the Observing dimension of mindfulness. All questions were outlined by Baer et al. (2006) as being significantly representative of these mindfulness dimensions. These questions were to control for potential differences between conditions on the Observing and Non-Reactivity dimensions of trait mindfulness before manipulation.

Following completion of these scales, individuals were randomly assigned to either a mindfulness tape or a control audio tape that had been used in previous research (Cropley, Ussher, & Charitou, 2007). Participants in the mindful condition listened to a 10-minute audio tape which instructed them to focus and become aware of sensations of the body (such as the

heart beating or the breath), while fully accepting any bodily sensation without reservation or judgment. The pure control condition listened to a 10 minute audio tape describing an English countryside. The control attention condition listened to the same audio tape as the pure control condition, but they were also told to pay attention for the word “parish” and make a check mark on a piece of paper when they heard it, in addition to being told that they would be tested on the material in the audio tape at the end of the study. This control attention condition was included to ensure that it was not the mere act of paying attention that causes the mindfulness condition to produce its effects, but rather what is attended to and the way it is attended to that is important. In this way, we could control for individuals in the pure control condition who might let their mind wander, as opposed to the mindfulness condition which likely stayed present in awareness (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). Once the 10 minute audio tape had completed, participants moved on to state mindfulness scales used to measure the Observe and Non-Reactivity dimensions of mindfulness.

Based on the procedure by Anicha et al. (2012) that demonstrated the relationship between the Observe dimension with perceptual attention, and the separate and distinct relationship between the Non-Reactivity dimension and cognitive flexibility, individual state mindfulness was measured through two state mindfulness scales in order to determine how Observing and Non-reactivity are affected by mindfulness training and how the associated attention and cognitive flexibility relates to IAT bias. The Toronto Mindfulness Scale (Lau et al., 2006) contains a “Decentering” subscale which measures the Non-Reactivity dimension, and the State Mindfulness Scale (Tanay & Bernstein, 2013) contains items which measure the Observing dimension. Both of these scales contain items that are very similar to the trait mindfulness scales

designed to measure these dimensions, only questions are framed in a present tense format. Once finished, participants completed a modified Trust Game task. This task measures implicit evaluations of trustworthiness, and has been shown to be significantly correlated with implicit racial attitudes (Stanley et al., 2010). All participants began with \$50 theoretical dollars and were told that the goal of the game was to accrue as much money as possible by the end of the game. Furthermore, participants were told that the individual with the highest total at the end of the game will win \$20 actual dollars. However, to make matters more difficult, they did not know whether they gained or lost money after each trial, but were told that if their money total reached \$0, then the game would end and they would be automatically disqualified. Participants encountered 150 pictures of interaction partners who varied in ethnic diversity, one at a time, with presentation order randomly determined for each participant. During each interaction, participants decided how much money they were willing to risk giving to the individual (\$0-\$10), knowing that the individual would receive quadruple the amount given. Furthermore, participants were told that each interaction partner had already decided to either give the participant half of the quadrupled money, or keep all of it for themselves. In actuality, there were no gains or losses to the initial \$50. At the conclusion of this task, participants completed the racial IAT to measure implicit racial attitudes, followed by the Motivation to Respond without Prejudice Scale (Plant & Devine, 1998) and a measure of explicit racial attitudes (The Symbolic Racism Scale, Henry & Sears, 2002), before being asked general demographic questions. Then, participants were debriefed and told to give their contact information to be entered into a drawing for \$20 before being thanked and allowed to leave.

Results

Preliminary Analyses

Several Univariate Analyses Of Variance (ANOVA) were used to ensure no significant differences existed between conditions in terms of the three dimensions of trait mindfulness before any manipulation had taken place. Results indicated no significant difference among conditions in terms of Trait Nonreactive mindfulness, $F(2, 84) = .49, p = .62$, Trait Observing mindfulness, $F(2, 84) = .48, p = .62$, Trait Acting with Awareness mindfulness, $F(2, 84) = .15, p = .86$, or their combined output, $F(2, 84) = .01, p = .99$.

Manipulation Checks

Several Univariate ANOVAs were used to determine potential differences along several dimensions of state mindfulness after participants listened to their assigned audio recording. When looking at the Toronto Mindfulness subscale of the Decentering dimension (equated with Non-Reactivity), there was a marginally significant difference among the conditions, $F(2, 84) = 2.93, p = .06, \eta_p^2 = .07$, with LSD tests indicating that the mindfulness condition was significantly higher ($M = 21.60, SD = .84$) than the control with attention condition ($M = 18.72, SD = .86, p = .02$), but not the pure control condition, ($M = 19.82, SD = .87, p = .15$). Control conditions were not significantly different from each other ($p = .37$). Planned contrasts revealed that the mindfulness condition was significantly more mindful on the Decentering dimension than that combined control conditions, $t(84) = 2.24, p = .01$, which were not different from each other, $t(84) = .90, p = .14$.

In terms of the total Toronto Mindfulness Scale, a significant difference existed, $F(2, 84) = 3.81, p = .03, \eta_p^2 = .08$, with the mindfulness condition significantly higher ($M = 40.50, SD =$

1.57) than the control with attention condition ($M = 34.52$, $SD = 1.60$), $p = .009$, and marginally significantly higher than the pure control condition ($M = 36.21$, $SD = 1.62$), $p = .06$. Control conditions were not significantly different from each other ($p = .46$). Planned contrasts revealed that the mindfulness condition was significantly more mindful on the total Toronto Mindfulness Scale than that combined control conditions, $t(84) = 2.65$, $p = .005$, which were not different from each other, $t(84) = .75$, $p = .23$.

With regards to the State Mindfulness Scale that measures the Observing dimension, there was a significant difference among the conditions, $F(2, 84) = 10.60$, $p < .001$, $\eta_p^2 = .20$, with the mindfulness condition exhibiting significantly higher ($M = 69.53$, $SD = 2.31$) state mindfulness than both the control with attention condition ($M = 57.07$, $SD = 2.35$), $p < .001$, and the pure control condition ($M = 55.75$, $SD = 2.40$), $p < .001$. Control conditions were not significantly different from each other ($p = .70$). Taken together, the mindfulness condition scored significantly higher on the Observing and Non-Reactivity dimensions of mindfulness, which support hypothesis two.

Primary Analyses

Trust Game. The crux of the experiment was to determine if a mindfulness intervention reduced prejudiced behavior when compared with two control conditions – one that merely listened to a control audio, and one that listened to the control audio with instructions to listen for a repeated word during the audio and mark it down while also understanding there to be questions regarding the audio later in the experiment. Two independent variables were included in the analysis: the between subjects variable of mindfulness and control conditions (audio), and a within subjects variable of exposure to black and white faces in the Trust Game (color).

A Repeated Measures ANOVA revealed a significant main effect for race, $F(1, 84) = 26.23, p < .001, \eta_p^2 = .24$, indicating that participants gave more money overall in the Trust Game to white interaction partners ($M = 262.36, SD = 8.54$) than to black interaction partners ($M = 238.64, SD = 8.87$), regardless of audio condition. There was not a significant main effect for audio condition in terms of the total amount given to interaction partners regardless of color, $F(2, 84) = 1.57, p = .22, \eta_p^2 = .04$. There was a significant interaction between race and audio condition, $F(2, 84) = 3.38, p < .04, \eta_p^2 = .07$. The difference between the amount given to black and white interaction partners was then calculated into one value, with positive numbers indicating a greater amount of money given to white participants than black participants over the course of the entire Trust Game (50 trials for each race). Post hoc LSD tests revealed that the mindfulness condition was significantly less biased ($M = 6.93, SD = 7.89$) than the pure control condition ($M = 30.71, SD = 8.16$), $p = .04$, and the control attention condition ($M = 33.52, SD = 8.02$), $p = .02$ (see also Figure 1). The two control conditions were not significantly different from each other, $p = .81$. Planned contrasts further validated that the mindfulness condition was less biased than the combined control conditions, $t(84) = 2.59, p = .006$. Overall, the mindfulness condition showed significantly less bias on the Trust Game than either of the two control conditions, supporting hypothesis four.

In order to explore the potential relationship between state mindfulness scores, motivation to respond without prejudice, and explicit bias with prejudiced behavior, simple Pearson's r correlations were calculated for the Toronto Mindfulness Scale, State Mindfulness Scale, and Internal and External Motivation to Respond without Prejudice Scales with Trust Game scores (see Table 1). With regards to state mindfulness, results indicated that there were

no significant correlations between any of the state mindfulness scales (or subscales) with prejudiced behavior on the Trust Game (all $r < .11$, all $p > .16$). No further analyses were conducted with state mindfulness scores. These results do not support hypothesis six, in that although the mindfulness manipulation caused a decrease in prejudiced behavior, the subjective measures of state mindfulness did not correlate with this reduced prejudice.

As for Motivation to Respond without Prejudice and Symbolic Racism, a significant negative correlation was found for the Internal Motivation to Respond without Prejudice scale, $r = -.25$, $n = 87$, $p = .01$, meaning that as internal motivation to respond without prejudice increased, prejudiced behavior decreased on the Trust Game. External Motivation to Respond without Prejudice was uncorrelated with Trust Game scores ($p = .46$). Symbolic Racism did show a significant correlation with prejudice on the Trust Game, $r = .24$, $n = 87$, $p = .01$, indicating that higher explicit racism was related to greater prejudice.

IAT. A Univariate ANOVA was then used to examine any potential differences among the three audio conditions in terms of their implicit bias. Results indicated no significant differences between the conditions, $F(2, 84) = .69$, $p < .50$, $\eta_p^2 = .02$. As it was predicted that the mindfulness condition would show less implicit bias, and that this decreased bias would disappear after controlling for the Observing the Non-Reactivity dimensions, hypotheses one and three were not supported. However, follow up tests were conducted to examine the potential relationship between implicit bias as shown on the IAT and the prejudiced behavior exhibited on the Trust Game separately for the mindfulness condition and the combined control conditions. Separate linear regressions for the combined control conditions and the mindfulness condition were performed with IAT score as the predictor variable and Trust Game giving differential as

the criterion variable. Results showed that IAT scores significantly predicted giving differential for the combined control conditions, $R^2 = .10$, $\beta = .32$, $F(1, 55) = 6.41$, $p = .01$, but not for the mindfulness condition, $R^2 = .01$, $\beta = .11$, $F(1, 28) = .34$, $p = .57$. Overall, more negative implicit attitudes predicted greater bias toward white faces in the Trust Game for the combined control conditions only, and not the mindfulness condition. These results partially support hypothesis five, in that IAT results did not overall predict prejudice on the Trust Game, but they did for the control groups separately.

Moderation analyses were then conducted using Andrew Hayes' macro for PROCESS (Hayes, 2013) in order to more fully investigate the potential interaction of condition with IAT score in predicting Trust Game giving differential. IAT scores were entered as the predictor variable, and Trust Game differential scores were entered as the criterion variable, with condition (combined control and mindfulness) entered as the moderator. The created interaction term between condition and IAT (Internal Motivation removed) was not significant, $\Delta R^2 = .005$, $F(1, 83) = .51$, $p = .47$, indicating that condition was not a significant moderator between the relationship of IAT and Trust Game differential scores.

Symbolic Racism. In addition, a Univariate ANOVA was performed in order to examine the effect of mindfulness on explicit bias on Symbolic Racism Scale. Results found a significant difference in Symbolic Racism between conditions, $F(2, 84) = 4.30$, $p < .02$, $\eta_p^2 = .09$. LSD post hoc tests revealed that the mindfulness condition exhibited significantly less Symbolic Racism ($M = 25.6$, $SD = .89$) than did either the pure control condition ($M = 28.21$, $SD = .92$), $p = .04$, or the control attention condition ($M = 29.17$, $SD = .90$), $p = .006$. The two control conditions were not significantly different from each other, $p = .46$.

Internal Motivation to Respond without Prejudice. Several Univariate Analyses Of Variance (ANOVA) were used to ensure no significant differences existed between conditions in terms Motivation to Respond without Prejudice. Results indicated no significant difference among conditions in terms of Internal Motivation to Respond Without Prejudice, $F(2, 84) = 2.07$, $p = .13$, External Motivation to Respond Without Prejudice, $F(2, 86) = .03$, $p = .97$, or their combined scores, $F(2, 84) = .67$, $p = .52$.

Separate linear regressions for the combined control conditions and the mindfulness condition were performed with Internal Motivation to Respond without Prejudice score as the predictor variable and Trust Game giving differential as the criterion variable for the combined control conditions. Results showed that Internal Motivation scores significantly predicted giving differential for the combined control conditions, $R^2 = .13$, $\beta = -.36$, $F(1, 55) = 8.14$, $p = .006$, but not for the mindfulness condition, $R^2 = .01$, $\beta = .12$, $F(1, 28) = .38$, $p = .54$. Overall, as Internal Motivation increased, giving more favorably to white compared with black interaction partners decreased, but only for participants in the combined control conditions and not the mindfulness condition.

Moderation analyses were then conducted using Andrew Hayes' macro for PROCESS (Hayes, 2013) in order to more fully investigate the potential interaction of condition with Internal Motivation in predicting Trust Game giving differential. Internal Motivation scores were entered as the predictor variable, and Trust Game differential scores were entered as the criterion variable, with condition (combined control and mindfulness) entered as the moderator. The created interaction term between condition and Internal Motivation was significant, $\Delta R^2 = .04$, $F(1, 83) = 3.83$, $p = .05$. Therefore, the condition participants belonged to was a

significant moderator of the relationship between Internal Motivation scores and Trust Game differential scores.

Discussion

The results of the study indicate that participants who underwent a mindfulness manipulation engaged in less prejudiced behavior than did participants in the control conditions. Specifically, participants who listened to a 10 minute audio tape that focused them on their sensations and thoughts in a nonjudgmental way were far less biased than control participants in their evaluation of trustworthiness for white and black individuals based solely on a picture of their face (Trust Game). In this manner, they “trusted” white and black individuals almost identically, giving members of both groups roughly the same amount of money in the belief that these individuals would not take it all and instead return the favor. On the other hand, participants in both control conditions trusted white individuals significantly more in the game based exclusively on a picture of a face, giving them more money than their black counterparts.

One could potentially expect that the mindfulness condition would give more money to individuals in the Trust Game in general because of the peace and understanding cultivated through the mindfulness audio. This could potentially cause them to see others as more trustworthy altogether, be more generous toward other people, or could also possibly cause their view of the importance of money and the need to keep and obtain it to decline. Alternatively, the mindfulness condition participants might be expected to give less money overall, as the increased observance and awareness could potentially make them more attuned or vigilant for distrustful individuals. While these are possible fruitful hypotheses for future research, the current results indicate that the difference in prejudiced giving among conditions was not based on any

condition giving more or less money to individuals in the Trust Game in general, as conditions were not significantly different from each other in terms of total amount given.

In support of these findings, individuals in the mindfulness condition also exhibited less explicit bias as measured by the Symbolic Racism Scale than did either of the control conditions. This means that they would be less likely to agree with or endorse statements such as “Over the past few years, blacks have gotten more economically than they deserve.” or “How much of the racial tension that exists in the United States today do you think blacks are responsible for creating?” (Henry & Sears, 2002). This is important in the context of the current research, because not only are participants who undergo 10 minutes of meditation more likely to act with less prejudice, they are also more likely to explicitly espouse and advocate equality in their values and in their evaluation of the current racial tensions that exist today. In this way, a more objective understanding of the racial climate may be possible, which could curtail the tendency to vilify the other side as the propagators of societal problems.

Importantly, all conditions were shown to not be significantly different in terms of their trait mindfulness scores before any manipulation took place. However, after the audio tape manipulation, participants in the mindfulness condition showed significantly higher state mindfulness scores than either of the control conditions. This revealed that the mindfulness manipulation did increase both the Observing and Non-Reactivity dimensions on the mindfulness condition. However, these state mindfulness scores did not independently nor jointly correlate with the prejudice scores from the Trust Game, although the correlations weakly trended in the right direction. It is possible that the limited scope of the dimensions of state mindfulness included in this experiment hindered a more holistic examination of the effect of

mindfulness on prejudice. It is possible that if the five dimensions of mindfulness were all included, that collectively their scores may have correlated and mediated the reduction in bias observed in the mindfulness condition. In essence then, while the Observing and Non-Reactivity dimensions may contribute to the decline in prejudice exhibited by the mindfulness condition, they are not all that define the mindful experience, with the remaining components playing a vital role in the change toward equality seen in the Trust Game. There currently are not mindfulness scales that measure the Non-Judging and Describing dimensions of state mindfulness.

Important was also the finding that the conditions did not differ in terms of their Internal or External Motivation to Respond without Prejudice. This, coupled with the finding that the conditions were similar in terms of trait mindfulness, and with the finding that the mindfulness condition exhibited higher state mindfulness scores after the manipulation, gives a strong indication that it is the manipulation at work that reduced prejudice and explicit bias. Furthermore, it only took only 10 minutes of meditation from a pool of participants that was likely full of novices to achieve these effects. This makes it highly probable that these effects are even more fully reduced (if not eliminated) and more dependably consistent in regular practitioners, even if they have not recently meditated. It is important to continue this line of research to determine how effective meditation can be in the long-term, how long these effects actually last, and how extensive the cultivation of equality through mindfulness can be.

Unexpectedly, the mindfulness condition did not show a reduction in implicit bias (as measured on the IAT) in comparison with control conditions. While this contradicts the findings by Lueke and Gibson (2014) that mindfulness reduces implicit bias, the current study contained

many more elements than did the previous study. Perhaps most importantly, in the previous study, the IAT was administered immediately after the mindfulness intervention had taken place. In the current study, participants not only had to report on numerous dimensions and aspects of their state of mindfulness after the mindfulness intervention, but they also had to go through 150 trials in the Trust Game as well before reaching the IAT. The temporal delay between the intervention and the administration of the IAT could contribute to the reason why the previous study's results were not replicated in terms of implicit bias. This result could give an indication of how the effects of cultivated mindfulness through meditation dissipate with time within the untrained novice. While implicit bias might be alleviated immediately after meditation, its effects could dissipate quickly for those who are unaccustomed to a mindful state of being. On the other hand, long-term practitioners are not only more familiarized with the state of being mindful, but also are able to delve more deeply into their meditative practice. This likely leads to a sustained state of mindfulness that dissipates very slowly with time, if at all.

Additionally, it may not merely be the passage of time that diminishes the impact of mindfulness cultivated through meditation, but what happens during that time frame that may ultimately subvert the potential benefits of mindfulness. Perhaps it is the engagement in other activities, and perhaps the type of activities, that may use up cognitive resources and cause the mind to revert back to its default associations. In terms of the current study, if there was an immediate decrease in implicit bias after the mindfulness intervention, then Trust Game itself may have been responsible for shifting this decreased implicit bias back to baseline levels. It is possible that the continuous exposure to black exemplars through the course of the Trust Game activated automatic stereotypical associations of "black as bad", which shifted the initially

decreased implicit bias back into a default network. While, on an explicit level, the mindful participants still acted with less prejudice and reported less explicit racism, the implicit associations were negatively affected. If this is true, it is unknown whether this shift in implicit attitudes occurred after only a few presentations of a black exemplar, or after the task had been completed, which allowed participants to switch back to their default associations. Future research should not only address the length of time that a simple mindfulness intervention may alter an individual's implicit associations or how long it has an effect in general, but also how performing other tasks may hasten the dissipation of the benefits of meditation. In addition, research should address when reduced implicit bias shifts back to default levels when an individual is exposed to stimuli that may activate automatic stereotypic associations.

The argument that the IAT results did not replicate previous research due to a separation between the intervention and administration of the IAT seems to be bolstered by the results of the separate linear regressions done on the combined control conditions and mindfulness condition in relation to how their IAT scores correlated with Trust Game scores. Whereas the participants in the combined control condition's IAT scores were highly predictive of their Trust Game scores, participants in the mindfulness condition showed no significant prediction of their Trust Game scores through their IAT scores. This is very similar to the results of Ostafin et al. (2012), in which they found that a mindfulness intervention weakened the relationship between implicit alcohol attitudes and drinking behavior, whereas a control group showed strong associations between the two. As mentioned previously, it is possible that implicit bias was initially reduced in the mindfulness group, but shifted back to default levels through exposure to black exemplars in the Trust Game task. This shift only affected implicit bias, and not behavior

on the Trust Game task itself, which would explain the weakened association between prejudice on the Trust Game and implicit bias on the IAT.

In much the same way, Internal Motivation to Respond without Prejudice (IMRP) also followed this same pattern, with strong prediction of prejudiced behavior for the control group but not the mindfulness group. In the case of the IAT, the relationship between prejudice and implicit bias may have been decoupled due to the mindfulness condition acting with less prejudice, but in being exposed to black exemplars implicit bias was reconstituted, resulting in the decoupled relationship. In terms of the IMRP, its relationship to prejudice behavior was possibly decoupled by the mindfulness process itself, and not from engaging in another task. In this way, mindfulness then reduced the predictive ability of IMRP on prejudice scores on the Trust Game, whereas the control conditions IMRP was highly predictive of Trust Game scores.

Conversely, it could be the case that the mindfulness intervention actually changed IMRP scores as well, compared with control conditions' IMRP scores which remained unchanged after the intervention. Again, exposure to black exemplars in the Trust Game may have activated automatic stereotypes, thus shifting this changed IMRP for the mindfulness condition back to default levels similar to the control conditions. If this occurred, an IMRP after the intervention may have still been predictive of Trust Game prejudice, whereas the relationship between the final IMRP score and Trust Game prejudice was decoupled in the mindfulness condition. It is possible that mindfulness actually increases IMRP, which would then explain the drop in prejudice on the Trust Game task. In this case, it is likely that an IMRP score after the control intervention would not have changed the relationship between IMRP and prejudice, as IMRP would likely maintain its predictive ability. Control condition participants would then vary on

their IMRP, which would predict how prejudice they would behave, whereas mindfulness condition participants would indicate overall higher levels of IMRP, which would predict overall lower levels of prejudice.

If it is the case that meditation decouples the relationship between IMRP and prejudiced behavior, then whereas the default mechanism is for higher internal motivation to result in less prejudice, mindfulness diminishes this relationship as well. To understand this, it is important to remember the nature of mindfulness in terms of how one relates to others. One of the aims of mindfulness is to reduce the separation that exists between the self and others. An internal motivation to act in a non-prejudiced way is still a conscious acknowledgement of the “otherness” of people that are different from the self. In fact, this type of acknowledgement can still result in treating other groups differently, even if it is in the form of reverse racism. It seems as though mindfulness puts the focus elsewhere. Whereas those who are internally motivated to be non-prejudiced will sometimes act in ways consciously and purposely to show this, the behavior of the mindful individual is not swayed by any internal motivation, but rather occurs through a present awareness and acceptance of the moment, and of sharing that moment with another. In that moment there is no separation, and no conscious need to prove how non-prejudiced one is. On the other hand, if it happens to be that mindfulness increases IMRP, which results in the reduced prejudice found in the current study, then perhaps an enhanced state of awareness cultivated through meditation increases the value and importance that the individual places on acting in a fair and unprejudiced manner to all people, regardless of their “otherness”. In this way, the mindful individual might be more sensitive to situations in which an opportunity to act in a non-prejudiced manner presents itself, and act accordingly. Future research should

determine the effect of mindfulness on IMRP, and if this effect then relates to any changes in prejudicial behavior.

The current research provides evidence that meditation can help reduce prejudice and explicit forms of racism. It also raised questions regarding the impact of attitudes, beliefs, or values to influence non-prejudiced behavior in mindful individuals. Overall, the results indicate that mindfulness allows the individual to just act with acceptance in every moment, regardless of who it is being shared with. While the current cultural climate is one of acceptance of others of all types, the change brought about by this ideal is slow-moving, often not reaching or affecting certain regions of the country. Furthermore, due to other factors, such as the normalcy of the association of black as violent (Bargh, Chen, & Burrows, 1996; Payne, Lambert, & Jacoby, 2002; Payne, 2005), even people who believe in these values often behave in subtle prejudiced ways. Mindfulness has the potential to hasten the unification of people in ways that extend far beyond any culturally approved type of credo. It has the potential to bring us closer with each other in a more profound way, a way in which we see each other truly and as possessing the same innate qualities and essence that we ourselves possess. In this way, we can hopefully dispose of this attempt to better the existing race relations, and instead endeavor to understand, accept, and exist in an enduring state of human relations.

REFERENCES

- Alberts, H. J. E. M., Mulkens, S., Smeets, M., & Thewissen, R. (2010). Coping with food cravings. investigating the potential of a mindfulness-based intervention. *Appetite, 55*, 160-163. doi:<http://dx.doi.org/10.1016/j.appet.2010.05.044>
- Alberts, H. J. E. M., Thewissen, R., & Raes, L. (2012). Dealing with problematic eating behaviour. the effects of a mindfulness-based intervention on eating behaviour, food cravings, dichotomous thinking and body image concern. *Appetite, 58*, 847-851. doi:<http://dx.doi.org/10.1016/j.appet.2012.01.009>
- Anicha, C. L., Ode, S., Moeller, S. K., & Robinson, M. D. (2012). Toward a cognitive view of trait mindfulness: Distinct cognitive skills predict its observing and nonreactivity facets. *Journal of Personality, 80*, 255-285. doi:<http://dx.doi.org/10.1111/j.1467-6494.2011.00722.x>
- Baer, R. A., Carmody, J., & Hunsinger, M. (2012). Weekly change in mindfulness and perceived stress in a mindfulness-based stress reduction program. *Journal of Clinical Psychology, 68*(7), 755-765. doi:<http://dx.doi.org/10.1002/jclp.21865>
- 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., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27-45. Retrieved from <http://0-search.proquest.com.catalog.lib.cmich.edu/docview/62099195?accountid=10181>

- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230-244. doi:<http://dx.doi.org/10.1037/0022-3514.71.2.230>
- Bishop, S. R., Lau, M. A., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., . . . Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230-241.
- Brown, C. A., & Jones, A. K. P. (2013). Psychobiological correlates of improved mental health in patients with musculoskeletal pain after a mindfulness-based pain management program. *The Clinical Journal of Pain, 29*, 233-244.
doi:<http://dx.doi.org/10.1097/AJP.0b013e31824c5d9f>
- 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.
- Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research, 1*, 11-34.
- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance. the philadelphia mindfulness scale. *Assessment, 15*, 204-223. doi:<http://dx.doi.org/10.1177/1073191107311467>
- Carmody, J., Reed, G., Kristeller, J., & Merriam, P. (2008). Mindfulness, spirituality, and health-related symptoms. *Journal of Psychosomatic Research, 64*, 393-403.
doi:<http://dx.doi.org/10.1016/j.jpsychores.2007.06.015>

- Casper, C., Rothermund, K., & Wentura, D. (2010). Automatic stereotype activation is context dependent. *Social Psychology, 41*, 131-136. doi:<http://dx.doi.org/10.1027/1864-9335/a000019>
- Chadwick, P., Hember, M., Mead, S., Lilley, B., & Dagnan, D. (2005). *Responding mindfully to unpleasant thoughts and images: Reliability and validity of the Mindfulness Questionnaire*. Unpublished manuscript.
- Ciesla, J., Reilly, L., Dickson, K., Emanuel, A., & Updegraff, J. (2012). Dispositional mindfulness moderates the effects of stress among adolescents: Rumination as a mediator. *Journal of Clinical Child and Adolescent Psychology, 41*, 760-770. doi:<http://dx.doi.org/10.1080/15374416.2012.698724>
- Collard, P., Avny, N., & Boniwell, I. (2008). Teaching mindfulness based cognitive therapy (MBCT) to students: The effects of MBCT on the levels of mindfulness and subjective well-being. *Counselling Psychology Quarterly, 21*, 323-336. doi:<http://dx.doi.org/10.1080/09515070802602112>
- Cropley, M., Ussher, M., & Charitou, E. (2007). Acute effects of a guided relaxation routine (body scan) on tobacco withdrawal symptoms and cravings in abstinent smokers. *Addiction, 102*, 989-993. doi: <http://dx.doi.org/10.1111/j.1360-0443.2007.01832.x>
- Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: Combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology, 81*, 800-814. doi:<http://dx.doi.org/10.1037/0022-3514.81.5.800>

- Dasgupta, N., McGhee, D. E., Greenwald, A. G., & Banaji, M. R. (2000). Automatic preference for white americans: Eliminating the familiarity explanation. *Journal of Experimental Social Psychology, 36*, 316-328. doi: <http://dx.doi.org/10.1006/jesp.1999.1418>
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*, 564-570.
doi:<http://dx.doi.org/10.1097/01.PSY.0000077505.67574.E3>
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5-18.
doi:<http://dx.doi.org/10.1037/0022-3514.56.1.5>
- Devine, P. G., Forscher, P. S., Austin, A. J., & Cox, W. T. L. (2012). Long-term reduction in implicit race bias: A prejudice habit-breaking intervention. *Journal of Experimental Social Psychology, 48*, 1267-1278. doi:<http://dx.doi.org/10.1016/j.jesp.2012.06.003>
- Djikic, M., Langer, E. J., & Stapleton, S. F. (2008). Reducing stereotypes through mindfulness: Effects on automatic stereotype-activated behavior. *Journal of Adult Development, 15*, 106-111.
- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. (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. doi:<http://dx.doi.org/10.1007/s10862-006-9035-8>

- Fledderus, M., Bohlmeijer, E. T., Smit, F., & Westerhof, G. J. (2010). Mental health promotion as a new goal in public mental health care: A randomized controlled trial of an intervention enhancing psychological flexibility. *American Journal of Public Health, 100*, 2372-2378. doi:<http://dx.doi.org/10.2105/AJPH.2010.196196>
- Goodman, M. J., & Schorling, J. B. (2012). A mindfulness course decreases burnout and improves well-being among healthcare providers. *International Journal of Psychiatry in Medicine, 43*, 119-128. doi:<http://dx.doi.org/10.2190/PM.43.2.b>
- Goodwin, C. L., Forman, E. M., Herbert, J. D., Butryn, M. L., & Ledley, G. S. (2012). A pilot study examining the initial effectiveness of a brief acceptance-based behavior therapy for modifying diet and physical activity among cardiac patients. *Behavior Modification, 36*, 199-217. doi:<http://dx.doi.org/10.1177/0145445511427770>
- Greenberg, J., Reiner, K., & Meiran, N. (2012) "Mind the Trap": Mindfulness Practice Reduces Cognitive Rigidity. *PLoS ONE, 7*, e36206. doi:10.1371/journal.pone.0036206
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464-1480. doi:<http://dx.doi.org/10.1037/0022-3514.74.6.1464>
- Hargus, E., Crane, C., Barnhofer, T., & Williams, J. M. (2010). Effects of mindfulness on meta-awareness and specificity of describing prodromal symptoms in suicidal depression. *Emotion, 10*, 34-42. doi:<http://dx.doi.org/10.1037/a0016825>

- Hawtin, H., & Sullivan, C. (2011). Experiences of mindfulness training in living with rheumatic disease: An interpretative phenomenological analysis. *The British Journal of Occupational Therapy, 74*, 137-142.
doi:<http://dx.doi.org/10.4276/030802211X12996065859283>
- Henry, P. J., & Sears, D. O. (2002). The symbolic racism 2000 scale. *Political Psychology, 23*, 253-283.
- Hülshager, U. R., Alberts, H. J. E. M., Feinholdt, A., & Lang, J. W. B. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology, 98*, 310-325.
doi:<http://dx.doi.org/10.1037/a0031313>
- Ito, T. A., Chiao, K. W., Devine, P. G., Lorig, T. S., & Cacioppo, T. (2006). The influence of facial feedback on race bias. *Psychological Science, 17*, 256-261.
doi:<http://dx.doi.org/10.1111/j.1467-9280.2006.01694.x>
- Jensen, C. G., Vangkilde, S., Frokjaer, V., & Hasselbalch, S. G. (2012). Mindfulness training affects attention—Or is it attentional effort? *Journal of Experimental Psychology: General, 141*, 106-123. doi:<http://dx.doi.org/10.1037/a0024931>
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10*, 144. Retrieved from <http://0-search.proquest.com/catalog.lib.cmich.edu/docview/236400367?accountid=10181>
- Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. New York: Hyperion.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, 8, 163-190.

Retrieved from [http://0-](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/617108041?accountid=10181)

[search.proquest.com.catalog.lib.cmich.edu/docview/617108041?accountid=10181](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/617108041?accountid=10181)

Kabat-Zinn, J., Massion, A. O., Kristeller, J., Peterson, L. G., Fletcher, K. E., Pbert, L., . . .

Santorelli, S. F. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *The American Journal of Psychiatry*, 149, 936-943.

Retrieved from [http://0-](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/618171819?accountid=10181)

[search.proquest.com.catalog.lib.cmich.edu/docview/618171819?accountid=10181](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/618171819?accountid=10181)

Kabat-Zinn, J., Wheeler, E., Light, T., Skillings, A., Scharf, M. J., Cropley, T. G., . . . Bernhard,

J. D. (1998). Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemotherapy (PUVA). *Psychosomatic Medicine*, 60,

625-632. Retrieved from [http://0-](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/619373824?accountid=10181)

[search.proquest.com.catalog.lib.cmich.edu/docview/619373824?accountid=10181](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/619373824?accountid=10181)

Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind.

Psychological Science, 330, 932.

Kold, M., Hansen, T., Vedsted-Hansen, H., & Forman, A. (2012). Mindfulness-based

psychological intervention for coping with pain in endometriosis. *Nordic Psychology*, 64,

2-16. Retrieved from [http://0-](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/1269431581?accountid=10181)

[search.proquest.com.catalog.lib.cmich.edu/docview/1269431581?accountid=10181](http://0-search.proquest.com.catalog.lib.cmich.edu/docview/1269431581?accountid=10181)

- Lagor, A. F., Williams, D. J., Lerner, J. B., & McClure, K. S. (2013). Lessons learned from a mindfulness-based intervention with chronically ill youth. *Clinical Practice in Pediatric Psychology, 1*, 146-158. doi:<http://dx.doi.org/10.1037/cpp0000015>
- Langer, E. J., Bashner, R. S., & Chanowitz, B. (1985). Decreasing prejudice by increasing discrimination. *Journal of Personality and Social Psychology, 49*, 113-120. doi:
<http://dx.doi.org/10.1037/0022-3514.49.1.113>
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., . . . Devins, G. (2006). The toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology, 62*, 1445-1467. doi:<http://dx.doi.org/10.1002/jclp.20326>
- Leys, C., Ley, C., Klein, O., Bernard, P., & Licata, L. (2013). Detecting outliers: Do not use standard deviation around the mean, use absolute deviation around the median. *Journal of Experimental Social Psychology, 49*, 764-766. doi:<http://0-dx.doi.org.catalog.lib.cmich.edu/10.1016/j.jesp.2013.03.013>
- Lueke, A. K. & Gibson, B. (2014). Mindfulness Meditation Reduces Implicit Age and Race Bias: The Role of Reduced Automaticity of Responding.
- Matchim, Y., Armer, J. M., & Stewart, B. R. (2011). Effects of mindfulness-based stress reduction (MBSR) on health among breast cancer survivors. *Western Journal of Nursing Research, 33*, 996-1016. doi:<http://dx.doi.org/10.1177/0193945910385363>
- McConnell, A. R., & Leibold, J. M. (2001). Relations among the implicit association test, discriminatory behavior, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology, 37*, 435-442.
doi:<http://dx.doi.org/10.1006/jesp.2000.1470>

- Miller, J. J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry, 17*, 192-200. Retrieved from <http://0-search.proquest.com.catalog.lib.cmich.edu/docview/618864133?accountid=10181>
- Monteith, M. J., Voils, C. I., & Ashburn-Nardo, L. (2001). Taking a look underground: Detecting, interpreting, and reacting to implicit racial biases. *Social Cognition, 19*, 395-417. Retrieved from <http://0-search.proquest.com.catalog.lib.cmich.edu/docview/619652637?accountid=10181>
- Morone, N. E., Greco, C. M., & Weiner, D. K. (2008). Mindfulness meditation for the treatment of chronic low back pain in older adults: A randomized controlled pilot study. *Pain, 134*, 310-319. doi:<http://dx.doi.org/10.1016/j.pain.2007.04.038>
- Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science, 24*, 776-781. doi:<http://dx.doi.org/10.1177/0956797612459659>
- Olson, M. A., & Fazio, R. H. (2006). Reducing automatically activated racial prejudice through implicit evaluative conditioning. *Personality and Social Psychology Bulletin, 32*, 421-433. doi:<http://dx.doi.org/10.1177/0146167205284004>
- Ostafin, B. D., Bauer, C., & Myxter, P. (2012). Mindfulness decouples the relation between automatic alcohol motivation and heavy drinking. *Journal of Social and Clinical Psychology, 31*, 729-745. doi:<http://dx.doi.org/10.1521/jscp.2012.31.7.729>

- Ostafin, B. D. & Kassman, K. T. (2012). Stepping out of history: Mindfulness improves insight problem solving. *Consciousness and Cognition*, *21*, 1031-1036.
- Paolini, B., Burdette, J. H., Laurienti, P. J., Morgan, A. R., Williamson, D. A., & Rejeski, W. J. (2012). Coping with brief periods of food restriction: Mindfulness matters. *Frontiers in Aging Neuroscience*, *4*, 1-9. doi:<http://dx.doi.org/10.3389/fnagi.2012.00013>
- Papies, E. K., Barsalou, L. W., & Custers, R. (2012). Mindful attention prevents mindless impulses. *Social Psychological and Personality Science*, *3*, 291-299. doi:<http://dx.doi.org/10.1177/1948550611419031>
- Payne, B. K. (2005). Conceptualizing control in social cognition: How executive functioning modulates the expression of automatic stereotyping. *Journal of Personality and Social Psychology*, *89*, 488-503. doi:<http://dx.doi.org/10.1037/0022-3514.89.4.488>
- Payne, B. K., Lambert, A. J., & Jacoby, L. L. (2002). Best laid plans: Effects of goals on accessibility bias and cognitive control in race-based misperceptions of weapons. *Journal of Experimental Social Psychology*, *38*, 384-396. doi:[http://dx.doi.org/10.1016/S0022-1031\(02\)00006-9](http://dx.doi.org/10.1016/S0022-1031(02)00006-9)
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology*, *75*, 811-832. doi:<http://dx.doi.org/10.1037/0022-3514.75.3.811>
- Prazak, M., Critelli, J., Martin, L., Miranda, V., Purdum, M., & Powers, C. (2012). Mindfulness and its role in physical and psychological health. *Applied Psychology: Health and Well-being*, *4*, 91-105. doi:<http://dx.doi.org/10.1111/j.1758-0854.2011.01063.x>

- Reibel, D. K., Greeson, J. M., Brainard, G. C., & Rosenzweig, S. (2001). Mindfulness-based stress reduction and health-related quality of life in a heterogeneous patient population. *General Hospital Psychiatry, 23*, 183-192. doi:[http://dx.doi.org/10.1016/S0163-8343\(01\)00149-9](http://dx.doi.org/10.1016/S0163-8343(01)00149-9)
- Richeson, J. A., & Ambady, N. (2003). Effects of situational power on automatic racial prejudice. *Journal of Experimental Social Psychology, 39*, 177-183. doi:[http://dx.doi.org/10.1016/S0022-1031\(02\)00521-8](http://dx.doi.org/10.1016/S0022-1031(02)00521-8)
- Roberts, K. C., & Danoff-Burg, S. (2010). Mindfulness and health behaviors: Is paying attention good for you? *Journal of American College Health, 59*, 165-173. doi:<http://dx.doi.org/10.1080/07448481.2010.484452>
- Ruocco, A. C., & Direkoglu, E. (2013). Delineating the contributions of sustained attention and working memory to individual differences in mindfulness. *Personality and Individual Differences, 54*, 226-230. doi:<http://dx.doi.org/10.1016/j.paid.2012.08.037>
- Samuelson, M., Carmody, J., Kabat-Zinn, J., & Bratt, M. A. (2007). Mindfulness-based stress reduction in massachusetts correctional facilities. *The Prison Journal, 87*, 254-268. doi:<http://dx.doi.org/10.1177/0032885507303753>
- Sassenberg, K. & Moskowitz, G. B. (2005). Don't stereotype, think different! Overcoming automatic stereotype activation by mindset priming. *Journal of Experimental Social Psychology, 41*, 506-514.
- Sinclair, S., Lowery, B. S., Hardin, C. D., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal of Personality and Social Psychology, 89*, 583-592. doi:<http://dx.doi.org/10.1037/0022-3514.89.4.583>

- Singh, N. N., Lancioni, G. E., Singh, A. N., Winton, A. S. W., Singh, J., McAleavey, K. M., & Adkins, A. D. (2008). A mindfulness-based health wellness program for an adolescent with prader-willi syndrome. *Behavior Modification, 32*, 167-181.
doi:<http://dx.doi.org/10.1177/0145445507308582>
- Stanley, D. A., Sokol-Hessner, P., Banaji, M. R., & Phelps, E. A. (2011). Implicit race attitudes predict trustworthiness judgments and economic trust decisions. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 108*, 7710-7775.
doi:<http://dx.doi.org/10.1073/pnas.1014345108>
- Tanay, G., & Bernstein, A. (2013). State mindfulness scale (SMS): Development and initial validation. *Psychological Assessment*, doi:<http://dx.doi.org/10.1037/a0034044>
- Wang, Y., Xin, T., Liu, X., Zhang, Y., Lu, H., & Zhai, Y. (2012). Mindfulness can reduce automatic responding: Evidences from stroop task and prospective memory task. *Acta Psychologica Sinica, 44*, 1180-1188. Retrieved from <http://0-search.proquest.com.catalog.lib.cmich.edu/docview/1314707862?accountid=10181>
- Webb, J. R., Phillips, T. D., Bumgarner, D., & Conway-Williams, E. (2013). Forgiveness, mindfulness, and health. *Mindfulness, 4*, 235-245. doi:<http://dx.doi.org/10.1007/s12671-012-0119-0>
- Zabelina, D. L., & Robinson, M. D. (2010). Creativity as flexible cognitive control. *Journal of Aesthetics, Creativity, and the Arts, 4*, 136-143.
- Ziegert, J. C., & Hanges, P. J. (2005). Employment discrimination: The role of implicit attitudes, motivation, and a climate for racial bias. *Journal of Applied Psychology, 90*, 553-562.
doi: <http://dx.doi.org/10.1037/0021-9010.90.3.553>

Table 1. *Correlation Matrix*

Variables	1	2	3	4	5	6
1.IMRP	1					
2.EMRP	.13	1				
3.Toronto MS	.10	-.15	1			
4.State MS	.11	-.22*	.85**	1		
5.Trust Game	-.25**	.01	-.15	-.04	1	
6.Symb. Racism	-.32**	-.07	-.12	-.09	.24*	1

Note: * $p < .05$; ** $p < .01$

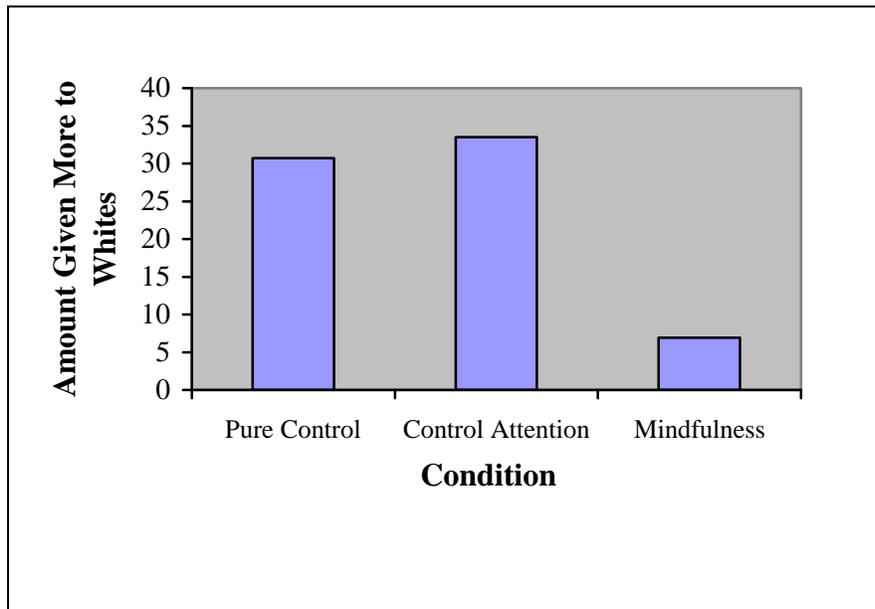


Figure 1. Trust Game Total Difference Scores

APPENDICES

THREE DIMENSIONS OF TRAIT MINDFULNESS

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost	Very	Somewhat	Somewhat	Very	Almost
Always	Frequently	Frequently	Infrequently	Infrequently	Never

I could be experiencing some emotion and not be conscious of it until sometime later. 1 2 3 4 5 6

I pay attention to whether my muscles are tense or relaxed. 1 2 3 4 5 6

I pay attention to how my emotions affect my thoughts and behavior. 1 2 3 4 5 6

I perceive my feelings and emotions without having to react to them. 1 2 3 4 5 6

I notice changes in my body, such as whether my breathing slows down or speeds up. 1 2 3 4 5 6

I drive places on "automatic pilot" and then wonder why I went there. 1 2 3 4 5 6

It seems I am "running on automatic," without much awareness of what I'm doing. 1 2 3 4 5 6

In difficult situations, I can pause without immediately reacting. 1 2 3 4 5 6

When I take a shower or a bath, I stay alert to the sensations of water on my body. 1 2 3 4 5 6

I notice the smells and aromas of things. 1 2 3 4 5 6

I sense my body, whether eating, cooking, cleaning, or talking. 1 2 3 4 5 6

I intentionally stay aware of my feelings. 1 2 3 4 5 6

I find myself listening to someone with one ear, doing something else at the same time. 1 2 3 4 5 6

- I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there. 1 2 3 4 5 6
- I rush through activities without being really attentive to them. 1 2 3 4 5 6
- I find myself preoccupied with the future or the past. 1 2 3 4 5 6
When I'm walking, I deliberately notice the sensations of my body moving. 1 2 3 4 5 6
- I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. 1 2 3 4 5 6
- I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. 1 2 3 4 5 6
- I watch my feelings without getting lost in them. 1 2 3 4 5 6
- I examine pleasant as well as unpleasant sensations and perceptions. 1 2 3 4 5 6
- I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. 1 2 3 4 5 6
- I notice how my emotions express themselves through my body. 1 2 3 4 5 6
- I find it difficult to stay focused on what's happening in the present. 1 2 3 4 5 6
- I tend not to notice feelings of physical tension or discomfort until they really grab my attention. 1 2 3 4 5 6
- I break or spill things because of carelessness, not paying attention, or thinking of something else. 1 2 3 4 5 6
- I find myself doing things without paying attention. 1 2 3 4 5 6
- I find myself preoccupied with the future or the past. 1 2 3 4 5 6
- I pay attention to sensations, such as the wind in my hair or sun on my face. 1 2 3 4 5 6
- I do jobs or tasks automatically, without being aware of what I'm doing. 1 2 3 4 5 6
- I snack without being aware that I'm eating. 1 2 3 4 5 6
- I tend to walk quickly to get where I'm going without paying attention to what I experience along the way. 1 2 3 4 5 6

I remain present with sensations and feelings even when they are unpleasant or painful. 1 2 3 4 5 6

I forget a person's name almost as soon as I've been told it for the first time. 1 2 3 4 5 6

I break or spill things because of carelessness, not paying attention, or thinking of something else. 1 2 3 4 5 6

Below is a collection of statements about your everyday experience. Using the 1-7 scale below, please indicate how much you agree or disagree with each statement. Please answer according to what really reflects your attitude rather than what you think your attitude should be. Please treat each item separately from every other item.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Disagree

Usually when I have distressing thoughts or images, I am able just to notice them without reacting.

1 2 3 4 5 6 7

Usually when I have distressing thoughts or images, I feel calm soon after.

1 2 3 4 5 6 7

Usually when I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

1 2 3 4 5 6 7

Usually when I have distressing thoughts or images, I just notice them and let them go.

1 2 3 4 5 6 7

TORONTO MINDFULNESS SCALE

Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?	Not at all	A little	Moderately	Quite a Bit	Very Much
1. I experienced myself as separate from my changing thoughts and feelings.	0	1	2	3	4
2. I was more concerned with being open to my experiences than controlling or changing them.	0	1	2	3	4
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations.	0	1	2	3	4
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are.	0	1	2	3	4
5. I was curious to see what my mind was up to from moment to moment.	0	1	2	3	4
6. I was curious about each of the thoughts and feelings that I was having.	0	1	2	3	4
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.	0	1	2	3	4
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.	0	1	2	3	4
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.	0	1	2	3	4
10. I remained curious about the nature of each experience as it arose.	0	1	2	3	4
11. I was aware of my thoughts and feelings without overidentifying with them.	0	1	2	3	4
12. I was curious about my reactions to things.	0	1	2	3	4
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.	0	1	2	3	4

Curiosity score: The following items are summed: 3, 5, 6, 10, 12, 13

Decentering score: The following items are summed: 1, 2, 4, 7, 8, 9, 11

STATE MINDFULNESS SCALE

Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?	Not at all	A little	Moderately	Quite a Bit	Very Much
1. I noticed pleasant and unpleasant emotions.	0	1	2	3	4
2. I noticed pleasant and unpleasant thoughts.	0	1	2	3	4
3. I noticed emotions come and go.	0	1	2	3	4
4. I was aware of different emotions that arose in me.	0	1	2	3	4
5. I felt aware of what was happening inside of me.	0	1	2	3	4
6. I was aware of what was going on in my mind.	0	1	2	3	4
7. I felt closely connected to the present moment.	0	1	2	3	4
8. I had moments when I felt alert and aware.	0	1	2	3	4
9. I actively explored my experience in the moment.	0	1	2	3	4
10. I felt that I was experiencing the present moment fully.	0	1	2	3	4
11. I tried to pay attention to pleasant and unpleasant sensations.	0	1	2	3	4
12. It was interesting to see the patterns of my thinking.	0	1	2	3	4
13. I noticed many small details of my experience.	0	1	2	3	4
14. I noticed thoughts come and go.	0	1	2	3	4
15. I found some of my experiences interesting.	0	1	2	3	4
16. I noticed physical sensations come and go.	0	1	2	3	4
17. I noticed some pleasant and unpleasant physical sensations.	0	1	2	3	4
18. I noticed various sensations caused by my surroundings (e.g., heat, coolness, the wind on my face).	0	1	2	3	4
19. I clearly physically felt what was going on in my body.	0	1	2	3	4
20. I felt in contact with my body.	0	1	2	3	4
21. I changed my body posture and paid attention to the physical process of moving.	0	1	2	3	4

Note: Questions 1-15 are State Mindfulness of Mind questions; 16-21 are State Mindfulness of Body questions

SYMBOLIC RACISM SCALE

1. It's really a matter of some people not trying hard enough; if blacks would only try harder they could be just as well off as whites.

- <1> Strongly agree
- <2> Somewhat agree
- <3> Somewhat disagree
- <4> Strongly disagree

2. Irish, Italian, Jewish and many other minorities overcame prejudice and worked their way up. Blacks should do the same.

- <1> Strongly agree
- <2> Somewhat agree
- <3> Somewhat disagree
- <4> Strongly disagree

3. Some say that black leaders have been trying to push too fast. Others feel that they haven't pushed fast enough. What do you think?

- <1> Trying to push very much too fast
- <2> Going too slowly
- <3> Moving at about the right speed

4. How much of the racial tension that exists in the United States today do you think blacks are responsible for creating?

- <1> All of it
- <2> Most
- <3> Some
- <4> Not much at all

5. How much discrimination against blacks do you feel there is in the United States today, limiting their chances to get ahead?

- <1> A lot
- <2> Some
- <3> Just a little
- <4> None at all

6. Generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class.

- <1> Strongly agree
- <2> Somewhat agree
- <3> Somewhat disagree
- <4> Strongly disagree

7. Over the past few years, blacks have gotten less than they deserve.

- <1> Strongly agree
- <2> Somewhat agree
- <3> Somewhat disagree
- <4> Strongly disagree

8. Over the past few years, blacks have gotten more economically than they deserve.

- <1> Strongly agree
- <2> Somewhat agree
- <3> Somewhat disagree
- <4> Strongly disagree