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A Comparison of Mindfulness and Incremental Theory Based Interventions

Kelsey Greenfield

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03 May 2013

### A Comparison of Mindfulness and Incremental Theory Based Interventions

In only a span of 20 years, the prevalence of obesity has dramatically increased in the United States. Thirty five percent of adults and seventeen percent of children are obese. Every state has an obesity prevalence of over twenty percent (CDC, 2013). The Center for Disease Control and Prevention defines obesity as having a body mass index (BMI) of 30 or greater. A person's weight and height are used to calculate BMI, which indicates level of body fatness that may lead to health problems (CDC, 2013). From the economy to healthcare, this weight trend has turned into a phenomenon that is affecting all areas of American society. However, even as the girth size of Americans increase, obesity has not become socially accepted.

Research indicates that although obesity levels have steadily increased over time, obese individuals are still held in social contempt. Marriage, desirable jobs, and high salaries are often difficult to obtain for the obese. This occurs because obese individuals are considered to be less attractive, intelligent, hard working, and self-disciplined than individuals of an average weight (Puhl & Heuer, 2009). Studies have suggested that weight stigmatization may increase vulnerability in obese individuals to psychological disorders, such as depression (Puhl & Heuer, 2009). Although there is no solid link between obesity and depression, studies have shown that lower self-esteem does result from a history of appearance focused teasing (Puhl & Heuer, 2009). However, the negative social effects of obesity are not limited to just adults.

Children also suffer from obesity stigma and obesity related health issues even though they may have little control over their eating habits or food choice. When given six pictures of possible playmates to choose from, children consistently ranked the obese

child last out of a child with crutches, with an amputated hand, a facial disfigurement and in a wheelchair. Since the original study done in the early 1960's, a more recent study showed that prejudice against the obese child had increased (Schwartz & Puhl, 2002). In accordance to the Hollywood stereotypical 'overweight bully,' children as young as three years old described an overweight child as mean and less desirable as a friend when compared to an average-weight child (Schwartz & Puhl, 2002). These studies indicate that children learn weight bias early, which in turn begins demoralizing overweight children early in life. Children exposed to weight stigma experience an increase in vulnerability to physiological and psychological & that can last well into adulthood even after weight has been lost (Puhl and Latner, 2007). However, the stigmatization and resulting consequences are not the only concerns for overweight and obese individuals.

Obesity can cause immediate and potentially irreversible consequences, such as Type 2 diabetes (Murtagh & Ludwig, 2011). Without major weight loss, Type 2 diabetes usually becomes permanent several years after onset, significantly decreasing life expectancy. Other health issues caused by obesity can be cardiovascular (ie: hypertension), orthopedic (ie: Blount's disease), hepatic (ie: nonalcoholic liver disease), pulmonary (ie: sleep apnea) and renal (ie: proteinuria). Childhood obesity threatens to reverse the current favorable trends in cardiovascular morbidity and mortality – meaning, this generation of children may be the first to have shorter lifespans than their parents (Daniels et al., 2009). Obesity in children is associated with increased overall mortality, specifically with increased risk of cardiovascular disease and diabetes in adults. Childhood development sets the stage for adulthood health due to the health consequences of obesity occurring earlier in adulthood when the onset occurs during

adolescence (Daniels et al., 2009). Once weight has been gained, it's incredibly hard to lose.

Between the social, economic and health implications, there appears to be no benefits to being overweight and a large incentive for being of a 'normal' size. This desire to be 'normal' is expressed in the multitude of media sources offering weight loss tips and the variety of TV shows based on weight loss, such as the Biggest Loser. Why then is it so hard for some individuals to lose weight? In particular, researchers have looked at implicit theories of weight as a possible answer.

### *Implicit Theories*

Researchers have established that implicit theories are conceptualized as specific beliefs concerning an attribute (Dweck, 1999). They are labeled as 'implicit' because they are not overtly expressed (Burnette, 2010). There are two subsets of implicit theories: entity and incremental. Entity theory states that traits are fixed; whereas incremental theory states that traits are malleable. Recently, implicit theories have been applied to the domain of weight, and this particular set of implicit theories may play a role in overweight individual's ability to manage their weight. Entity theorists would believe that weight cannot be changed, and implicit theories would believe that weight can be changed.

When people internalize this social-cognitive phenomena, it can impact how they view themselves and their behavior. This appears to be especially true in regards to weight management. Burnette (2010) found that implicit theories of weight can predict coping strategies of dieting setbacks and potential future success. Specifically, individuals primed with the entity theory of weight were less likely to persist on future

diets when faced with a setback than individual primed with the incremental theory (Brunette, 2010). For entity theorists, present failures indicate unavoidable future failures, but for incremental theorists, present failures only indicate a need for more effort to ensure future successes. Thus, holding an incremental theory of weight may promote better weight management and inducing individuals to hold this belief instead of an entity theory may be an effective intervention method.

### *Mindfulness*

However, mindfulness interventions may be an even better approach to weight management and have recently gained more attention. Mindfulness involves paying attention to one's unfolding experiences including sensations, thoughts, and emotions. In a mindful state, people are better at fending off impulsive behaviors, like over eating, due to not responding to situation with conditioned reactions (Brown & Ryan, 2003). When an individual is mindfully aware, they are less likely to act without first analyzing the situation. For example, an individual who's in a mindful state would not impulsively snack while watching TV because they'd be aware they're not hungry but rather simply eating because it is a conditioned response to the activity. In addition to facilitating behavioral control to promote accomplishing end goals, mindfulness promotes behavioral regulation that optimizes general well being. The mindful processing of internal and external information enables the better regulation of action by achieving a thorough and observant understanding of choices and situational options.

Developing weight management interventions have never been more important. If an effective intervention can prevent an overweight child or adult from becoming obese, than they may be spared from the mental and physical consequences previously discussed.

Previous research as indicated that this could be very plausible. Paolini, Burdette, Laurienti, Morgan, Williamson, and Rejeski (2012)'s study suggests that mindfulness interventions may be particularly beneficial for older adults that have a high drive to consume food. They found that adults with high mindfulness scores perceived their ability to control their eating behavior better than adults with low mindfulness scores. However, they still experienced physical sensations of craving and hunger, but controlled their urges differently than adults with low mindfulness scores (Paolini et al., 2012). Furthermore, Papiés, Barsalou and Custers (2012)'s study that found mindfulness might help facilitate self-regulation by preventing impulses towards appealing food. Furthermore, mindfulness meditation may be able to promote self-control under low resource conditions, such as temptation of appealing foods (Friese, Messner, & Schaffner, 2012). Due to these findings, mindfulness interventions appear to be a valid solution.

The proposed study compared the effectiveness of an incremental theory intervention and a mindfulness awareness intervention. Both intervention methods appear to be successful given previous research, but they have yet to be compared.

### *Hypotheses*

- 1: Participants primed with mindfulness or incremental theories of weight will report higher self efficacy in portion control compared to control participants.
- 2: Participants primed with mindfulness will have lower calorie consumption than those primed with incremental theories who in turn will have lower calorie consumption than the control participants.

### Methods

*Participants*

The participants consisted of 62 (71.9% female) University or Richmond students. Of these participants, eleven had a BMI over 24.9 (overweight) and six had a BMI below 18.5 (underweight).

*Procedure*

This study employed a 3-group between-subjects design with intervention method (mindfulness, incremental mindset and control) as the independent variable. Calorie consumption and self-efficacy for portion control are the two dependent variables. The participants were initially told that they are taking two separate studies: one SAT prep material assessment and one involving a taste test upon watching a short video clip.

The SAT prep assessment portion of this study was composed of a set of questionnaires related to either a reading excerpt or mindfulness task in order to prime the participant with their condition. All three conditions answered corresponding questions to their respective activities as if they were rating the tasks' suitability as SAT prep material. The incremental theory of weight manipulation was conducted by using Psychology Today-type article that presented information supporting an incremental theory of weight. The article discussed the malleability of weight and provided fictional studies as evidence. The mindfulness manipulation was similar to the one used by Papies, Barsalou and Custers (2012). In the mindfulness condition, participants viewed a slideshow of pictures that elicit liking or disliking. They were asked to view their thoughts and reactions as transient states of mind. The control group read a neutral passage about Hadrian's Wall, an ancient Roman ruin located in England.



Once the first task had been completed, the researcher directed them to the next portion of the study. Task two required the participant to rate a number of different snack foods on a variety of qualities (ie: crunchiness, saltiness, sweetness). They were told that the researcher was looking at how different genres of TV show influence taste. They were informed that they were allowed to continue to eat after they rated the snack food qualities. The video clip of a surfing documentary was played for approximately ten minutes.

After the taste, they were administered a manipulation check involving a brief questionnaire on mindfulness and implicit theory to ensure that the intervention priming was successful. They also completed a brief final questionnaire that included an eating restraint scale and self-efficacy portion control questionnaire.

### *Measures*

**Implicit Theories of Weight Questionnaire** (6 items; Likert 1-7, with 1 being strongly disagree and 7 being strongly agree,  $\alpha = .90; .95$ ). Sample item: “You have a certain body weight, and you can’t really do much to change it.”

**Mindful Attention Awareness Scale (MAAS)** (15 items; Likert 1-6, with 1 being almost always and 6 being almost never,  $\alpha = .89$ ). Sample Item: “I could be experiencing some emotion and not be conscious of it until some time later. “

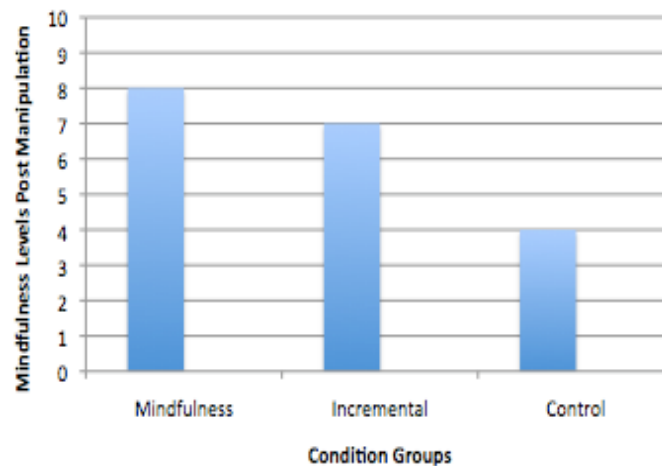
**Self-Efficacy Portion Control** (10 items; Likert 1-5, with one being strongly disagree and 5 being strongly agree) Sample item: “I believe I can eat standard food portions when served portions that are too large.”

**Behavioral eating measure:** The before and after weight of snack bowls were taken using a food scale. The amount of calories were calculated by weight change. For

example, if the snack bowl weighed 5oz before and 4oz after, the calories in 1oz of the snack consumed was calculated.

## Results

One-way Anovas were run on each of the manipulation checks for mindfulness and implicit theories. The mindfulness manipulation succeeded  $F(2,61) = 5.65, p < .006$ . However, the incremental theory manipulation check was not successful ( $p < .799$ ). There was only a marginal difference between the mindfulness levels between the incremental manipulation ( $M = 3.70, SD = 0.18$ ) and the mindfulness manipulation ( $M = 4.06, SD = 0.17$ ). Both conditions scored significantly higher on mindfulness than the control condition ( $M = 3.27, SD = 0.16$ ) As such, the incremental and mindfulness conditions were combined into one overarching ‘experimental’ condition.



The hypothesis that condition moderates the relationship with BMI and self-efficacy for portion control was tested and supported using Hayes’ SPSS Macro for Probing Interaction in OLS and Logistics Regression. This analysis employed a least squared regression in which participants’ BMI and condition were entered into the equation along with the two-way interaction term. Neither BMII nor condition directly predicted

efficacy. However, there was a significant interaction between BMI and condition ( $B = .046, p < .09$ ). This interaction is visually depicted in Figure 1.

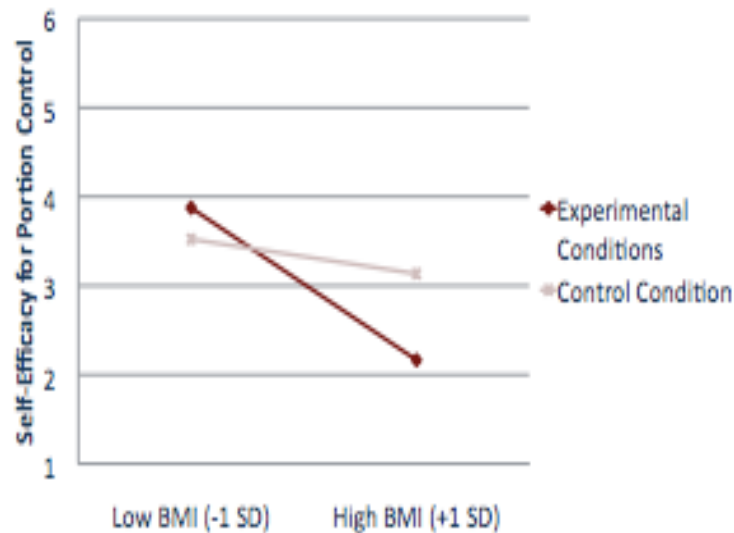


Figure 1: Participants with greater BMIs report lower levels of self-efficacy in the experimental, but not control, condition.

Tests of simple slopes across the conditions revealed a significant and strong association between BMI and efficacy in the experimental condition ( $B = -.09, p = .003$ ). In the control condition, there was no association ( $B = -.02, p = .38$ ).

### Discussion

Although the results did not support any of the three hypotheses, there are findings worthy of discussion. There was a negative correlation between high BMI and low self-efficacy in the experimental condition, which indicates that high mindfulness may be harmful to some extent in regards to weight management. This finding goes against all other previous research (Paolini et al., 2012; Papies, Barsalou & Custers, 2012; Friese, Messner, & Schaffner, 2012), which has only indicated positive effects of high levels of mindfulness. Although we did find that the experimental group ate slightly less than the control, which would be inline with previous research, this finding was not

significant so no conclusions can be drawn. Furthermore, these studies strictly used obese participants so it cannot be assumed the positive effect found in these studies was due to using participants with low BMIs. Overall, this study deviates from its predecessors and may reveal a darker side of mindfulness.

The findings suggest that mindfulness may cause an overweight patient to feel as if they cannot control their portion sizes. When an individual with a high BMI has their mindfulness level increased, they become more aware of their size. This may trigger a low-self efficacy for portion control because the awareness of their already large body-size may cause them to feel unable to gain control of their eating. They lacked the control to keep them from becoming overweight or obese so they may doubt their ability to ever control their weight. Portion control efficacy may cause the behavioral outcome of overeating. If overweight individuals believe they lack control, they will continue to consume an unhealthy amount of calories resulting in more weight gain. Most troubling about this finding is that the mindfulness manipulation was not food or weight specific. It increased mindfulness levels in general indicating that any sort of mindfulness awareness can negatively impact an overweight individual's weight management efforts.

This study was not without its limitations. First and foremost, the incremental theory manipulation did not work. As a result, the original intention of this study to compare weight management interventions could not be tested. In addition, the student body of the University of Richmond is not a good sample of the overweight population, which present a problem due to the finding of high mindfulness and low self-efficacy being an issue for individuals with high BMIs. In general, University of Richmond students tend to be health conscious or at least have normal range BMIs. The 18%

overweight BMI range of participants indicates this trend and is not a good representation of the 68% of overweight or obese adults in the US (CDC, 2013). Replicating this finding in a larger population of individuals would indicate that this was not a chance occurrence with in the small subject population. It is also possible that the provided snacks were unappetizing to the participants. This was controlled for in part by offering a variety of snacks, but it is also possible that the variety was still unappealing. Time of day and varying levels of participant hunger may have also played a role. Despite these limitations, the current findings present a unique building block for future research.

As addressed before, previous mindfulness research has only established mindfulness as a helpful weight management tool. This study highlights an unexpected consequence of increasing mindfulness levels. It suggests that increasing mindfulness alone may not be enough to foster self-regulation. Worse, it may even be detrimental to promoting self-control for individuals with a high BMI. With this in mind, the next step should be to pursue research that bridges the gap between previous research and this study. If this negative correlation between BMI and efficacy under mindfulness conditions is a greater trend, then it is imperative to understand what psychological buffering can protect against this negative side effect of mindfulness.

Clearly, previous research demonstrates that mindfulness is helpful, but it does not appear that unregulated mindfulness is always helpful. Future research may combine the mindfulness message with a positive, self-esteem message. Coupling the mindfulness message with an effective incremental message might also buffer against the negative side effects. Promoting mindful awareness, but then asserting that weight can change,

may be more effective in fostering self-regulation than simply making overweight individuals mindfully aware.

Although the levels of adult obesity have slowed, childhood obesity continues to grow at alarming rates. Developing an effective weight management intervention could be the answer to the mounting problem. This research illustrates how unintentionally increasing awareness of body size can result in a continuation of the problem. We must rethink our understanding of mindful awareness in case its negative consequences are widespread phenomena. Furthermore, this study even further highlights the detrimental effect of the obesity stigma. It is entirely possible that by raising the awareness level of an obese individual, they become more aware of the stereotypes against them. In order to fully combat obesity, we must also combat the stigma that may be preventing overweight individuals from accomplishing weight loss. Mindfulness has the potential to be a great tool in weight management, but further research needs to be done to better understand the negative consequences and provide a buffer to them.

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