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Lifestyle Intervention in Emerging Adulthood: A Brief Acceptance-Based Behavioral Intervention with Young Adults

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LIFESTYLE INTERVENTION IN EMERGING ADULTHOOD: A BRIEF ACCEPTANCE-BASED BEHAVIORAL INTERVENTION WITH YOUNG ADULTS

by

Spencer M. Richards

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ABSTRACT

Lifestyle Intervention in Early Adulthood: A Brief Acceptance-Based Behavioral Intervention with Young Adults

by

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Utah State University, 2015

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Obesity and weight-related health problems represent an ever-growing global health crisis. Despite decades of ongoing study, few evidence-based intervention options exist for behavioral healthcare providers to treat this costly and medically complex condition. The current study explored the utility of an investigational acceptance-based behavioral intervention of acceptance and commitment therapy (ACT). Thirty-six young adults were randomly assigned to the information control or experimental group intervention consisting of four, 90-minute sessions of ACT. Experimental group participants had significant improvements in weight-related psychological flexibility, which correlated with healthful changes in eating process behavior. This study supports previous literature in the utility of ACT for weight-related problems and extends findings by providing preliminary evidence for brief ACT interventions for managing weight in

emerging adulthood. Future research is needed to determine the durability and generalizability of treatment effects.

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PUBLIC ABSTRACT

Lifestyle Intervention in Early Adulthood: A Brief Acceptance-Based Behavioral Intervention with Young Adults

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Across the U.S., obesity and overweight represent a rapidly growing public health concern that have been associated with expensive and debilitating outcomes such as depression, cancers, diabetes, and other metabolic disorders, cardiovascular disease, and significant disruption in quality of life, in addition to the tremendous public health costs. The current study examined a brief, randomized-controlled trial of acceptance and commitment therapy (ACT) with overweight and obese young adults.

Study participants were randomly assigned to a 4-week experimental ACT group or an information control group, which received psychoeducational materials regarding lifestyle behaviors recommended by the Centers for Disease Control and Prevention (CDC). The results of the current study broadly showed that the experimental intervention was effective at improving weight-related psychological flexibility, which was also associated with reductions in emotionally avoidant eating and uncontrolled eating. In addition, the study showed relationships between improvements in psychological flexibility and eating process variables.

The results of this study hold important implications for future research in the utility of ACT to address overweight- and obesity-related lifestyle change. While the study was limited due to small sample size, it nevertheless suggested that weight-related psychological flexibility is an important construct to address and target in the treatment of overweight and obesity. It may be an effective means of decreasing emotional eating and improving a sense of control while eating. The findings support previous research supporting ACT as an empirically supported intervention for improving the quality of life of adults struggling with overweight and obesity. Results from this study are encouraging and support the utility of ACT, even in brief format, to possibly improve the lives of overweight and obese young adults.

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CHAPTER I

INTRODUCTION

Obesity and weight-related health problems represent an ever-growing global health crisis. In the U.S., more than two thirds of adults are overweight or obese (Ogden et al., 2006; World Health Organization [WHO], 2012). Over the past several decades, the rates of obesity have risen consistently despite billions of dollars devoted to intervention and prevention efforts. This has left the fields of medicine, public health, psychology and many others to explore what impact this epidemic has on both the individuals suffering from obesity and related illnesses as well as the larger societal consequences.

Overweight and obesity are generally described in terms of the body mass index (BMI), which is a ratio of height to weight using the formula $BMI = weight_{kg}/height_{m}^{2.}$ The BMI defined overweight as BMI = 25.0-29.9 and obesity as BMI > 30.0. Both overweight and obesity place individuals at increased risk for deleterious health effects (National Institutes of Health [NIH], 2012a). Specifically, these individuals face increased rates of cardiovascular disease, hypertension, stroke, liver disease, cancer, reproductive health problems, and type 2 diabetes (DM-II; Centers for Disease Control and Prevention [CDC], 2012). In addition, obese individuals have an estimated 40-60% rate of psychological comorbidity, most often depression and anxiety (Vaidya, 2006).

Obesity appears to be an escalating health problem for young adults. Morrell, Lofgren, Burke, and Reilly (2012) surveyed 2,722 college students (M = 19.1 years of age) over a 3-year period of open recruitment (cross-sectional design) and found that

approximately 47% of men and 27% of women were overweight or obese by BMI. A recent investigation by Huang and colleagues (2003) indicated that the average college student exercises fewer than three times per week and 70% consumes fewer servings of fruits and vegetables than is recommended by the USDA. These and other studies (e.g., Sparling, 2007) consistently implicated unhealthy lifestyle factors as central to the growing obesity and overweight in young adult populations. Furthermore, emerging adulthood may be a "critical period" for health behavior formation and establishment of positive health habits at younger age portends better health outcomes later in life (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). While there may be somewhat increased risk in intervening in an overweight/obese population due to physical limitations or comorbidities, it may be more effective to intervene within a sample of young adults as the behavioral patterns that may contribute to weight problems are not as well practiced.

Obesity-related behavioral and physical health problems result in significantly increased healthcare costs to both individuals and society (Cai, Lubitz, Flegal, & Pamuk, 2010). One report found that in 2008, the cost of obesity and related conditions totaled approximately $147 billion and this was nearly two times the estimate from the prior 10-years ($78.5 billion; Finkelstein, Trogdon, Cohen, & Dietz, 2009). Another recent estimate suggested that obesity among adults costs approximately $73 billion in lost workplace productivity alone (Finkelstein, DiBonaventura, Burgess, & Hale, 2010). There are many possible explanations for the growing prevalence of obesity including economic and technological factors (Finkelstein, Ruhm & Kosa, 2005), addiction-like patterns of consumption of highly pleasurable and calorie-dense foods (Pretlow, 2011),

and global patterns of urbanization, immigration, and other sociocultural factors (Candib, 2007). For example, Candib highlighted particularly vulnerable cultural groups, such as individuals from Native American, Hispanic, poor, or immigrant backgrounds. In her discussion, Candib cited cultural factors such as possible mistrust or misunderstanding of medical professionals' communication, so-called "obesogenic" environmental causes (e.g., lack of access to nutritious foods, poverty, lack of safe places to play), and increasing urbanization as factors which disproportionately affect particular cultural groups.

Weight loss has been shown to have significant health impacts for obese individuals including decreasing risk for developing cardiovascular disease, diabetes, high cholesterol, depression, and many other problems (Goldstein, 1992). Unfortunately, the trend across the past several decades has consistently shown that while many interventions were effective at producing significant weight loss during active intervention, regain of the original weight loss over the next 3- to 24-month interval was the norm (Mann et al., 2007). This trend highlights both the importance of effective interventions to manage and reduce weight, as well as those that offer potential to retain progress over time. It is of paramount importance that effective interventions provide individuals with lasting skills that can be utilized once active treatment concludes in order to provide lasting beneficial outcomes.

In the behavioral health realm, weight management interventions have focused traditionally on diet modification and increased physical activity via behavioral principles and self-monitoring (Wadden & Butryn, 2003). These interventions tend to yield less

than 3% weight loss by 6- to 24-month follow-up (Dahn et al., 2011; Michaud, Goldman, Lakdawalla, Zheng, & Gailey, 2012; Munsch et al., 2007). In addition, such interventions tend to be large-scale (≥ 30 hours of active intervention), take place over many months, and may also minimize external validity in contexts not suited for brief treatments (e.g., primary care). Brief cognitive-behavioral interventions for obesity and overweight have not yet been found to be highly utilized or efficacious (Littman, Boyko, McDonell, & Fihn, 2012).

An alternative approach to traditional behavioral interventions may offer more durable behavioral change in overweight and obese individuals (Forman, Butryn, Hoffman, & Herbert, 2009; Niemeier, Leahey, Palm, Brown, & Wing, 2012). Acceptance-based behavioral interventions (ABBIs), such as acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999), have begun to show promising results in weight management and enhancing quality of life in overweight and obese populations. Rather than focusing on behavioral and cognitive control, ABBIs focus on increasing individuals' metacognitive awareness of their decision-making processes, improving connection with and commitment to valued behaviors, and enhancing ability to experience discomfort without automatically defaulting to strategies of escape and/or avoidance (Forman et al., 2009). Within the framework of ACT, this confluence of factors is described as psychological flexibility. Hayes, Pistorello, and Levin (2012) defined psychological flexibility as "contacting the present moment as a conscious human being, fully and without defense, as it is and not as what it says it is, and persisting or changing in behavior in the service of chosen values" (p. 985).

Forman and Butryn (2015) described the limitations of current "first-line" cognitive behavioral intervention (i.e., to be utilized upon first contact with a treatment provider) for obesity and suggested that an acceptance-based framework may more effectively support adherence to behavioral changes through cultivation of weight-related psychological flexibility (WRPF). Psychological flexibility has been shown to correlate with behavioral change in treatments for obesity (Forman et al., 2009; Lillis, Hayes, Bunting, & Masuda, 2009). Specifically, enhancing psychological flexibility has predicted significant improvements in weight loss maintenance, behavioral change, and improvements in quality of life (Forman et al., 2009). Such changes have been shown to correlate with increasing the capacity to experience painful cognition and affect related to weight stigma, reduce the impact of weight-related shame, and decrease behavioral avoidance (Forman et al., 2009; Lillis et al., 2009).

Forman and colleagues (2009) conducted a 12-week open trial utilizing an ACT protocol and were able to show approximately 6% weight loss at posttreatment and an additional 3% weight loss at 6-month follow-up. Another recent pilot study (Niemeier et al., 2012) found ACT both highly acceptable to overweight and obese participants and effective at producing significant weight loss (average 6.6% loss) after 6 months of weekly intervention and those changes were actually greater (9.6%) at 6-month follow-up. Importantly, these changes were correlated with theoretically predicted process variables (e.g., psychological flexibility, emotional eating) at both posttreatment and 3-month follow-up. One limitation in both the Niemeier and colleagues and the Forman and colleagues study was that both were open trials without control groups. In addition,

currently studied ACT interventions for weight management have been conducted over 12-24 weeks which is a length that is likely untenable in most clinical environments. A recent large-scale investigation found the average duration of outpatient psychotherapy in a community setting to be approximately 9 hours (Gibbons et al., 2011).

In summary, obesity is a costly issue and one that is intractably related to health behaviors established at a young age. While some cognitive-behavioral interventions have been shown to be effective while in active treatment, they have generally not been able to demonstrate maintained improvements in the months following active treatment. In addition, there are few effective weight-loss interventions that can be delivered on a large scale in a brief and targeted manner. While preliminary results suggest the possible utility of ACT in the treatment of overweight and obesity, no published studies to date have compared ACT to a randomly assigned information-control group. Similarly, these interventions have all been conducted within hospital settings and have been so extensive in terms of length and time commitment that they may have limited external validity within a community sample. Further, no such studies have been conducted examining the effects of these interventions specifically within a population of young adults. As individuals in this developmental period may be living alone for the first time and experiencing a greater level of autonomy with regard to lifestyle choices, it may be beneficial to facilitate health-consistent values and patterns of behavior. In doing so, it may also aid in prevention of overweight, obesity, and related health problems later in life.

The primary purpose of this study was to develop and evaluate a brief, group-

based ACT intervention that was implemented within a sample of young adults (ages 18-30 years) and compare this with a randomly assigned psychoeducational information control group. The *first objective* of this study was to assess the utility of a brief, group-based ACT intervention in impacting (a) lifestyle behaviors (i.e., eating patterns and physical activity level), (b) psychological process variables previously shown to relate importantly to these behaviors, and (c) BMI. The *second objective* of this study was to evaluate the relationships of ACT-related psychological constructs (e.g., psychological flexibility, emotionally avoidant eating, valued living) with dietary intake, physical activity, and lifestyle behaviors. The *third objective* of this study was to evaluate the ability of changes in these psychological process variables to predict changes in eating behavior, physical activity, and quality of life.

CHAPTER II

REVIEW OF LITERATURE

Over the past several decades, worldwide attention has been brought to increasing rates of overweight and obesity across the lifespan (Flegal, Carroll, Ogden, & Curtin, 2010; Mathur, Stigler, Lust, & Laska, 2014). A pattern has been observed in many countries, including the U.S., United Kingdom, and other industrialized nations, wherein increasing numbers of individuals are classified as overweight or obese (WHO, 2012). According to recent information from the WHO, when classifying by BMI, nearly 2 billion people worldwide qualified as overweight (BMI = 25.0-29.9) or obese (BMI > 30.0). In the U.S., a recent review estimated that 68.5% of adults qualified as overweight or obese, representing approximately 212 million individuals and rates continue to rise (Ogden, Carroll, Kit, & Flegal, 2014).

Prevalence rates of obesity and overweight are not equal across various U.S. population groups, including ethnicity. In a recent study, Flegal and colleagues (2010) found that non-Hispanic White men had the lowest rate of obesity and in the U.S. (31.9%), while Hispanic men reported at 34.3%, and non-Hispanic Black men had the highest rate among men at 37.3%. Even greater disparities were observed between ethnic groups of women with 33% of non-Hispanic white women qualifying as obese, 43% of Hispanic women, and nearly half (49.6%) of non-Hispanic black women reporting a BMI $\geq$ 30. The findings from the overweight literature report analogous trends, with a total of 72.3% of men of all races reporting BMI $\geq$ 25 (72.6% of non-Hispanic White men, 79.3% of Hispanic men, and 68.5% of non-Hispanic Black men) and 64.1% of women of

all races (61.2% of non-Hispanic White women, 76.1% of Hispanic women, and 78.2% of non-Hispanic Black women) reporting BMI ≥ 25 (Flegal et al., 2010).

Qualitative research has lent important perspectives in conceptualizing the lived experiences of overweight and obese young adults. In a convenience sample qualitative study, Pretlow (2011) reviewed an open-access website for overweight and obese preteens, teens, and young adults in a qualitative review and identified several important themes for difficulty managing weight. Pretlow combed and coded bulletin board posts and online multiple-choice quizzes posted by adolescents and young adults over several years of postings. More than 29,000 individual IP addresses (the researcher's proxy measure of unique visitors) participated, with individuals ranging in age from 8-21 years who were, by their self-reported weights, obese by BMI on average ($M_{BMI} = 33.7$). Many of the adolescents and young adults cited feeling out of control while eating, eating to manage emotions, and using pleasurable foods to avoid unpleasant internal events. Pretlow translated these internet responses into criteria for substance use disorders per the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000). For example, 46% of respondents endorsed feeling "strong cravings" for pleasurable food, 77% endorsed eating more than they did prior to becoming overweight, and 37% endorsed feeling "addicted to certain foods." According to Pretlow, a majority of participants endorsed three or more symptoms necessary to meet criteria for a substance use disorder. While this study undeniably has methodological limitations (e.g., convenience sampling, questionable data reliability due to anonymous self-reporting), it may highlight some

possibly important themes for the lived experience of overweight and obese individuals in late adolescence and emerging adulthood. It may be that these individuals, even as early as adolescence, are learning to avoid painful emotions with highly pleasurable and ubiquitous foods.

Finkelstein and colleagues (2005) pointed to possible economic and technological factors in understanding increasing levels of obesity across the lifespan. The authors implicate the increasing technological advances in manufacturing (i.e., limited physical demands) and the gradual decline in manual labor as possible contributors to an increasingly sedentary American lifestyle, though are quick to acknowledge this as an insufficient explanation alone. Rather, Finkelstein and colleagues discussed dramatic increases in caloric intake, especially through sugars (particularly sugary soda and juices), refined carbohydrates, and fats across the last quarter-century. Increasing availability and pervasiveness of high calorie, nutrient-lean foods, as well as mindless consumption through increased snacking behaviors may play a significant role in explaining currently observed obesity trends (Finkelstein et al., 2005).

Dr. Lucy Candib, M.D., at the University of Massachusetts Medical School, has suggested that explanations such as exercising too little and eating too much oversimplify the issue of obesity, particularly as its differential representation across cultural groups (Candib, 2007). Candib asserted that national and international systemic factors and the increasing trend of economic globalization differentially impact various cultural groups. For example, some important factors which Candib explored are the impact of global trade policies on cheap fats, sugars, corn, and soy; the high cost of fresh produce;

sedentary entertainment; urbanization and immigration leading to increased access to social and family contexts which may promote obesity; and even problems related to the nutritional deficiencies in utero (Candib, 2007).

Regardless of etiological factors, overweight and obese individuals often face increased risk of many chronic, pervasive, and deleterious health problems (NIH, 2012b). Epidemiological research has found that obese individuals are more likely to suffer from health conditions such as cardiovascular disease, hypertension and stroke, liver disease, sleep apnea, reproductive health problems, and certain forms of cancer (CDC, 2012). In addition, DM-II (inability to effectively regulate insulin production and absorption) is the most common form of diabetes and is observed at disproportionately high rates in the overweight and obese (Nguyen, Nguyen, Lane, & Wong, 2011). Long-term complications from DM-II often include kidney dysfunction, neuropathy, and vision difficulties (CDC, 2012).

The financial burden of obesity-related illnesses is significant for individuals, health care systems, and the general public (Cai et al., 2010; Finkelstein et al., 2009). The Trust for America's Health and the Robert Woods Johnson Foundation released a report in 2012 estimating that the cost of preventable, obesity-related illnesses could rise by an additional $48-$66 billion in the next 20 years. It also estimated anticipated costs between $390-$580 billion annual losses in productivity related to obesity. Finkelstein and colleagues estimated that obesity results in an additional 56% in health care costs over an obese individual's lifetime, totaling approximately $147 billion, nearly 10% of annual medical costs from obesity alone in the U.S. This financial burden is expected to

increase exponentially in the coming years. Using retrospective data from 1971-2000, Cai and colleagues estimated that over the course of a typical lifetime, individuals suffering obesity cost the Medicare system approximately an additional $50,000 from ages 45-65 years.

Obesity and Overweight in Early Adulthood

Prevalence of obesity and overweight in early adulthood has been a subject of study for behavioral researchers for more than four decades (Pargman, 1969). Much of this research has focused on college students—both internationally and within the U.S. In both the U.S. (Adderley-Kelly, 2007; Huang et al., 2003; Wharton, Adams, & Hampl, 2008) and internationally (Al-Rethaiaa, Fahmy, & Al-Shwaiyat, 2010), concerns have been raised about the increasing prevalence of overweight and obesity among young adults. Prevalence estimates range based on sampling method, subgroup, and geography. These estimates tend to show that over the past decade, between 30-55% of college-age adults are classified as overweight or obese by BMI. While these estimates are below the overall national average for adults, it is noteworthy because young adults are presumably in a position to develop lifestyle behavioral patterns that may foreshadow future health behaviors (Von Ah et al., 2004).

Morrell and colleagues (2012) examined a similar trend in emerging adults. Morrell and colleagues were interested in a large-scale screening and early identification of metabolic syndrome (i.e., a clustering of various risk factors for cardiovascular disease, diabetes, and other weight-related health problems) and various other health

problems in emerging adulthood (ages 18-24 years). In a long-term, cross-sectional study, Morrell and colleagues surveyed 2,722 young adults and collected data regarding diet and physical activity, as well as biochemical and clinical markers of health. The researchers found that approximately 47% of men and 27% of women in their college sample were overweight or obese by BMI (M_{men} = 25.5kg/m^2, M_{women} = 23.7kg/m^2). The results also indicated that nearly two thirds of these college-aged men had elevated blood pressure and nearly 10% were identified with metabolic syndrome (i.e., hypertension, dyslipidemia, elevated blood glucose level, and excess fat around waist and abdomen). Additionally, increased cholesterol, unhealthy levels of sugar and fat, and poor overall nutrition, occurred in more than 50% of the sample. The authors concluded that overweight and obesity presented an immediate and pressing risk for young adults' development of lifelong chronic health conditions including diabetes and cardiovascular disease.

Other recent publications (Huang et al., 2003; Sparling, 2007) implicated problematic lifestyle behaviors as strong contributors to the trend of overweight and obesity in young adults. Huang and colleagues studied the health behavior of over 700 college students (M_{age} = 19.2 years). The authors found that college students reported an average of 2.8 days of aerobic exercise (approximately half amount recommended by CDC) and that 70% ate fewer fruits and vegetables than recommended by the U.S. Department of Agriculture (USDA). The authors noted a trend for less exercise and poorer nutrition as students progressed further in school.

Mathur and colleagues (2014) conducted latent class analysis of the health

behaviors of more than 17,000 young adults at 2- and 4-year colleges. The authors found that overall, more than 49% of the students were overweight or obese by BMI. Nearly 70% of the students spent an unhealthy amount of time engaged in television viewing or leisure computer use, which significantly reduced their likelihood of physical activity. Overweight and obese young adults of all races and educational levels were more likely to be inactive, eat unhealthily, and spend an unhealthy amount of time in sedentary leisure activities.

Given that a high (and increasing) proportion of young adults are increasingly unhealthy (Huang et al., 2003; Mathur et al., 2014; Sparling, 2007) and that this is a critical developmental period to establish healthful lifestyle habits, this age group is an important starting point for investigational interventions for obesity. The results of the Huang and colleagues study further implicated the increasingly unhealthy lifestyle behaviors engaged in by college students and the potential utility of effective lifestyle intervention for this population. Given the significant risks of developing unhealthful lifestyle habits in this developmental period, designing interventions to possibly alter the health trajectories of young adults and avoid potentially chronic, expensive, and debilitating health conditions is clearly warranted.

Benefits of Weight Loss

Strong evidence exists suggesting that for the overweight and obese, modest weight loss can have significant health benefits. The CDC suggested that "… no matter what your weight loss goal is, even a modest weight loss, such as 5 to 10% of your total

body weight, is likely to produce health benefits, such as improvements in blood pressure, blood cholesterol, and blood sugars" (CDC, 2012). The CDC defined meaningful weight loss around 5-10%. The same recommendations are made by the U.S. Surgeon General and the National Institutes of Health (NIH, 2012a). Specifically, these federal organizations recommend weight loss, increased physical activity, and a balanced, healthful diet that is rich in fruits and vegetables and low in fat.

The health benefits of the implementing lifestyle changes recommended by the CDC, Surgeon General, NIH, and other healthcare organizations have been consistently supported by research. In a review of literature, Goldstein (1992) indicated that weight loss of 10% or less in obese individuals showed various and powerful health benefits including reduction in hypertension symptoms, improved glycemic control, lowered cholesterol, and increased life expectancy. More recently, Vidal (2002) conducted a systematic review of empirical literature and added that weight loss appears to improve cardiovascular symptoms individually and appeared to prevent the problematic clustering of multiple cardiovascular symptoms. In addition, Vidal (2002) reported that moderate weight loss (approximately 10% of total body weight) in obese individuals has a powerful preventative impact on DM-II and related comorbidities (e.g., neuropathy, heart disease) Franz and colleagues (2007) asserted that moderate and sustained weight loss may help prevent or ameliorate symptoms associated with DM-II, hyperlipidemia, and hypertension.

In a rigorous empirical study, Wing and colleagues (2011) aimed to predict reduction in cardiovascular disease risk factors in overweight and obese individuals (BMI

≥ 25.0) with type 2 diabetes. This study included a large (N = 5,145, M_{age} = 58.7 years) and culturally diverse (37% from ethnic or racial minority groups) sample recruited from 16 sites across the U.S. Individuals provided information regarding systolic and diastolic blood pressure, blood cholesterol, triglycerides, blood glucose, height/weight, as well as a host of demographic data. The authors aimed to predict reduction in cardiovascular disease risk factors based on reduction in weight. By way of linear and logistic regression analyses, Wing and colleagues were able to show that percent of weight loss at 12-month follow-up was associated with reduction in several risk factors including systolic blood pressure (r = 0.20, p < .001), diastolic blood pressure (r = 0.12, p < .001), blood glucose (r = 0.27, p < .001), Hba_{1C} (r = 0.34, p <.001), HDL blood cholesterol (r = -0.23, p < .001), and triglycerides (r = 0.26, p < .001). These results were evident even for individuals who lost only a modest amount of weight (approximately 5%) and greater weight loss was associated with even more dramatic improvement in cardiovascular symptoms.

There also appears to be psychological benefits to weight loss in the overweight and obese. Linde and colleagues (2011) conducted a randomized control trial comparing traditional behavioral weight loss (BWL) treatment with a combined treatment of both weight loss and depression. In this study, 203 adult women (M_{age} = 52 years) participated in a cognitive behavioral treatment consisting of 26 weekly group therapy sessions lasting 90 minutes (for BWL only) or 120 minutes (for BWL + depression) over 6 months. Linde and colleagues assessed weight and depression symptoms at 6- and 12-month intervals. Women in both groups lost a significant amount of weight and were significantly less

depressed at posttreatment assessment, though no significant differences were found at 6-month follow-up. Both the BWL and BWL+ depression interventions were modestly effective at reducing depression symptoms and slight weight reduction (average 5-7 lbs loss; approximately 3% overall loss). In additional analyses of the Linde and colleagues data, Simon and colleagues (2010) reported that a weight reduction was accompanied by reduction in depression symptoms and increases in physical activity during the first 6 months of a BWL treatment.

Ross and colleagues (2009) investigated the utility of a BWL program and the roles of weight loss and physical activity in predicting various aspects of health-related quality of life. Nearly 300 adult women participated in the 6-month intervention focused on lifestyle enhancement via increased physical exercise, enhanced nutrition, and weight loss. Ross and colleagues found that reduction in weight was associated with improved scores across seven of nine domains of quality of life. Most notable among these improvements are the relationships measured on the Medical Outcomes Study Short Form (SF-36; Ware, Snow, Kosinski, & Gandek, 2000) for general health ($r = .27$, $p = .001$), vitality ($r = .27$, $p < .01$), and physical functioning (0.21, $p < .01$). These positive correlations demonstrate that decreases in weight are associated with improved health-related quality of life.

Similar to Ross and colleagues (2009), Wing and Phelan (2005) surveyed individuals who had successfully maintained weight loss over extended periods of time (> 1 year). The authors found some typical psychological and physical benefits. For example, 95% of individuals reported significant increase in quality of life. In addition,

91% reported a decrease in depression symptomatology and 92% reported that physical activity was less difficult. For these individuals, maintaining weight loss was a significant life change that they viewed as helpful in staying engaged in healthful lifestyle behaviors (e.g., eating healthily, remaining physically active).

In summary, reductions in weight and increases in physical activity may be accompanied by a myriad of benefits within the overweight and obese populations. These potential benefits include decreased risk of cardiovascular disease, depression, psychological distress, as well as enhanced quality of life. While the benefits of weight loss are clear, efforts to behaviorally intervene in this domain have proved extraordinarily challenging.

Michaud and colleagues (2012) attempted to quantify the cost-effectiveness of pharmacological and surgical obesity intervention in middle-aged adults. In their models, current interventions are extraordinarily costly for the improvement in quality of life and increased quality adjusted life years (QALYs), a metric used to determine cost-effectiveness of an intervention. The measure of QALY includes information about both the number of years of life added by an intervention, as well as the anticipated quality of life during those years. Michaud and colleagues reported that due to increased financial productivity, tax contributions, and other earnings, the cost-effectiveness ratio of pharmaceutical intervention (i.e., weight-loss drugs) was approximately $50,000 per QALY. Michaud and colleagues stated, “Pharmacotherapy does not appear to be cost-effective from a social point of view. Its absolute effect on health and life expectancy is... on the order of months” (p. 637). The authors stated that bariatric surgical interventions

offered a lower cost of $10,000 per QALY. Both of these figures differ considerably from the cost of behavioral intervention. Krukowski, Tilford, Harvey-Berino, and West (2011) investigated the outcomes of a behavioral weight loss (BWL) trial with 323 overweight and obese adults. Krukowski and colleagues looked at the life years gained (LYG) after intervention and the cost per LYG. Relative to no intervention, the authors found that administering a 6-month, in-person behavioral intervention cost an average of $333 per participant and averaged approximately $3,306 cost per LYG. This is approximately 33% the cost of the previously reported cost of bariatric surgery and 7% the cost of pharmacological intervention per LYG.

Efficacy of Traditional Behavioral Weight Loss Interventions

Given the significant and problematic health consequences, financial burden, and recent declaration of a global epidemic by the WHO, it comes as no surprise that empirical literature on this topic tends to focus on prevention and treatment. Prevention and treatment efforts range from widespread psychoeducation and psychosocial intervention to bariatric surgery. From the mental health front, the efforts of intervention researchers have focused on primarily behavioral and diet-based programs. Levy, Finch, Crowell, Talley, and Jeffery (2007) reported that behavioral interventions for obesity were both the best studied and most effective forms of current intervention. However, results of empirical intervention studies tend to yield only modest effects in the treatment of obesity (Forman et al., 2009). Such treatments tended to show approximately 5-10% loss in body mass, but also generally showed these results only in the presence of active

intervention, with half of participants returning to pre-treatment weight at follow-up (Wadden & Butryn, 2003) and typically less than 10% maintaining weight loss beyond 12 months following the intervention (Michaud et al., 2012). For the overweight and obese, losing weight in the short-term via an intervention was likely, but maintaining weight loss was often more difficult (Mann et al., 2007).

Findings from empirical literature across the area of weight loss and long-term weight management were mixed. Recent evidence for various cognitive behavioral weight loss and weight management interventions at times appeared promising. For example, Dahn and colleagues (2011) found that utilizing the "MOVE!" program (a large-scale cognitive behavioral intervention developed in the Veterans Healthcare Administration [VHA] system and focused on long-term lifestyle change; http://www.move.va.gov/), individuals achieved approximately 1.6kg/year weight loss over a 5-year period. This intervention required a 2-hour self-management session, followed by 10 weekly group sessions lasting from 1.5-2 hours for a total of approximately 17-22 hours of intervention. However, Littman and colleagues (2012) found when evaluating the MOVE! program within the VHA system, fewer than 5% of eligible veterans participated in the program and those who did participate lost an average of 1.3lbs at 12-month follow-up.

Another recent randomized clinical trial compared the efficacy of three conditions of psychosocial intervention: Cognitive-behavioral therapy (CBT), a BWL condition, and guided self-help (Cooper et al., 2010). The researchers hypothesized that problematic self-defeating beliefs lie at the root of weight management problems. Specifically,

through the CBT intervention, the researchers hoped to challenge beliefs that participants held regarding their inevitable failure and inability to maintain patterns of healthy behavior, supposing that this would lead to better maintained weight loss than BWL alone. What the researchers found, however, was that at 3-year follow-up, no differences were observed between the CBT and BWL conditions, and that participants had gained back all or nearly all of the weight lost during the intervention. Individually-based behavior modification from a traditional CBT framework offered little to long-term obesity treatment.

In an international study (Switzerland), Munsch and colleagues (2007) reported a similar pattern of results utilizing a CBT framework in the treatment of overweight and obese individuals engaged in binge eating. Specifically, Munsch and colleagues compared intensive CBT and BWL conditions consisting of 16 weekly group sessions, followed by monthly group sessions for 6 additional months. In total, the researchers in both conditions provided a total of 33 hours of intervention for participants. Of note, greater than 27% of participants withdrew from treatment prior to completion. One possibility is that the relatively large time commitment represented a potentially unrealistic level of time commitment for participants. At posttreatment, initial analyses suggested that CBT performed better at reducing BMI and binge-eating episodes. However, by 12-month follow-up, no differences were observed for CBT and BWL. In addition, and even more problematic for the utility of these interventions for long-term weight loss, no differences in BMI were observed for either condition compared to pretreatment. Participants in both conditions failed to lose weight and did so at an equal

rate, despite an average of over 30 hours of intervention.

A very recent pilot investigation by Stice and colleagues (2015) attempted to evaluate an obesity prevention program for young adults (M_{age} = 19.3 years) at risk of future obesity. Nearly 150 young adults were randomly assigned to either a cognitive reappraisal program, a program focusing on caloric intake and physical activity, or educational conditions. Participants in the cognitive reappraisal group were taught traditional cognitive skills aimed at reducing desire for unhealthy foods and with particular focus on generating reappraisals that encouraged consumption of healthful foods. The researchers also included fMRI scans at various time points, which showed that those participants being taught traditional cognitive therapy skills exhibited greater activity in the centers for inhibitory control and reduced activation in the "attention/expectation region" (p. 124). This did not translate to meaningful weight changes. The cognitive reappraisal group, BMI increased by 1% from pre- to postintervention, similar to control. In behavioral weight loss alternative condition (i.e., six sessions of focused support to make lifestyle changes), participants lost < 1% of total BMI. In total, while the cognitive reappraisal group showed some significant decrease in fat consumption, no groups saw statistically significant changes in BMI at posttreatment or 6-month follow-up.

Grilo, Masheb, Wilson, Gueorguieva, and White (2011) reported similar results for their randomized control trial comparing CBT and BWL in obese adults with binge-eating disorder (BED). Participants (N = 125) in the Grilo and colleagues' trial participated in CBT, BWL, or a combination (CBT + BWL) for weight management. The

investigators found that while CBT performed better at reducing binge frequency, BWL alone proved superior at reducing weight. However, average weight losses were modest in all conditions. At posttreatment, CBT participants had lost approximately 1.7 pounds, BWL approximately 8.7 pounds, and CBT+BWL pounds. By 12-month follow-up, however, the losses were 3.1l pounds (1.2%), 5.4 pounds (2.2%), and 6.2 pounds (2.6%), respectively. Each condition failed to approach the generally accepted clinically significant loss of 5-10% for obese individuals.

Some psychosocial interventions have provided more promising results. For example, The Counterweight Programme (Laws, 2004) was an intensive, long-term, multifaceted intervention including components of psychoeducation, behavior modification, goal-setting, physical activity enhancement, diet planning, and pharmacological intervention within a primary care setting. The program was administered by a number of multidisciplinary professionals from nurses to mental health professionals and dietary specialists. In an initial report, for those who were engaged in all elements of the multifaceted program, 42.7% achieved greater than 5% weight loss from baseline at 12-month follow-up, with an average of 4.7 kg (approximately 10.4 pounds) lost. These results supported a high level of integration and perhaps model an ideal scenario for long-term chronic obesity management, the scale and level of involvement of the program may be prohibitive for many patients. For example, in low-income community mental health, Gopalan and colleagues (2010) reported that it was typical for patients to receive 3-4 sessions of treatment.

In recent years, attention has been paid to predicting clinically meaningful weight

loss over longer timeframes. Wing and Phelan (2005) reviewed common threads within the experiences of those who had successfully maintained weight loss. The authors drew their sample from the National Weight Control Registry, a nationwide database of individuals who had maintained weight loss over extended periods of time (http://www.nwcr.ws/). The registry was established by Drs. Rena Wing and James Hill of the Brown University Medical School and included over 10,000 individuals. Participants in this study had to have maintained at least 10% weight loss for at least 1 year, though the sample surveyed had lost significantly more than that. Participants in this study lost an average of 72 pounds and had maintained losses for an average of 5 years. Wing and Phelan found several behavioral predictors of successful weight loss and maintenance. A vast majority (83%) had their weight loss spurred by a "triggering event," such as a medical emergency, a picture or reflection of themselves, or reaching an all-time high weight. The most common experience (23%) was a medical event, suggesting the potential importance of medical professionals in initiating meaningful weight loss. Additional factors were also common among successful registry members. For example, nearly 60% reported high levels of dietary consistency (e.g., not altering diet for special occasions), particularly between weekdays and weekends, while many reported this consistency during holidays (48%). Important behavioral predictors of successful weight loss also included eating low-calorie, low-fat diets, moderate-high levels of physical activity (approximately 1 hour/day), decreasing portion size, regularly eating breakfast, and regularly monitoring weight. Some modest weight regain was also common. For individuals who gained at least 2-4 pounds back during the first year of

maintenance, only 11% recovered to lose that weight again. Wing and Phelan indicated that the relatively low rates of recovery from relapse highlighted the importance of catching slips prior to full-blown relapses.

Pharmacological interventions have also been explored in an effort to prevent and treat obesity. These treatments have generally focused on one of two primary objectives: appetite suppression or disruption of nutrient absorption. Cerulli and Malone (1998) reviewed the efficacy literature on various pharmacological treatments for obesity, such as selective serotonin reuptake inhibitors (SSRIs), and found that while these treatments seemed to offer some benefit in regulating eating behavior, they were not sufficient to effect meaningful and enduring change of dysfunctional eating. Saad and Goren (2011) reported the therapeutic utility of increasing testosterone to mediate some of the implicated biochemical processes evidenced in preventing obese individuals from losing weight, but concluded with recommendations of further study of combined pharmacological and psychological intervention for treatment at the individual level.

Bariatric surgery (including gastric bypass and adjustable gastric band restriction) has been reported as the most efficacious treatment for obesity (Kofman, Lent, & Swencionis, 2010). Individuals frequently see dramatic weight loss immediately after such surgical procedures are performed. Recent studies have found that for many individuals, bariatric surgery leads to long-term weight loss and maintenance (de la Cruz-Muñoz et al., 2010). However, because of the invasive and potentially hazardous physical effects of these surgeries, others have recommended that such procedures be utilized judiciously (Cerulli & Malone, 1998). Cambi, Marchesini, and Baretta (2015) concluded

that in addition to the risk of complications of surgery, postsurgical needs are also extensive in patients undergoing bariatric surgery. For example, Cambi and colleagues found that in a sample of individuals undergoing Roux-Y gastroplasty (one of the most common methods of bariatric surgery for obese individuals), significant nutritional deficiencies were found among a high number of patients. Some examples include iron deficiency anemia (61.2%), vitamin B12 (71.4%), and vitamin D (> 90%). In addition, Cambi and colleagues found that nearly all patients reported memory complaints, concentration problems, and irritability.

Despite the strong empirical support for the benefits of weight loss, it is crucial to conceptualize meaningful health behavior change beyond numbers on a scale. Nutritionist Linda Bacon, Ph.D., has published extensively in advocacy of broader definitions of healthfulness beyond weight (Bacon, 2010). For example, Bacon and Aphramor (2011) argued that clinically meaningful improvements in health can be seen by improving health behaviors (e.g., internally regulated eating behavior, cultivating enjoyable physical activity routines) whether or not weight decreases.

Other researchers have raised possible ethical concerns about conducting evaluations and treatment of obesity with psychological intervention. Fleck and Petersmarck (2008) argued that focusing intervention narrowly on weight may in fact be deleterious to participants and that it may reinforce societal biases and prejudices against overweight individuals. Holm (2007) contended that the justification or motivation of obesity intervention as societal benefit can be seen as paternalistic and possibly even coercive to the individual. Furthermore, it is necessary to consider the ethics of

intervention for obesity when a large body of evidence suggests the participants are likely to regain most, if not all or even more, of the weight they lose (Bacon & Aphramor, 2011; Michaud et al., 2011). It is, therefore, incumbent upon intervention researchers to evaluate the relationship between quality of life and weight to lend support to the need for weight management intervention for young adults.

Self-guided restriction-based weight control strategies are very common among US adults and have been studied for a number of years. Dieting (i.e., deliberately restricting consumption of any number of dietary nutrients thought or shown to be consistent with weight management) has been discussed for decades with mixed recommendations. French, Jeffery, and Murray (1994) reported that over 70% of U.S. adults had engaged in dietary restriction methods (e.g., decreasing fat intake, reducing overall food consumption, calorie restriction) at least once in the past four years. However, the efficacy of these strategies was found to be mixed and not predictive of overall enduring weight change.

More recently, substantial effort has been put forth to explore the role of dieting in both healthful and unhealthful changes in eating behavior. Dietary restraint has been found to be predictive of reduced consumption of unhealthy food and long-term weight change when measured in a laboratory setting (e.g., Hofmann, Adiaanse, Vohs, & Baumeister, 2015). However, dieting behavior and a high importance placed on weight in adolescence has been shown to predict ongoing ineffective dieting and disordered eating behavior in emerging adulthood (Loth, MacLehose, Bacchianeri, Crow, & Neumark-Sztainer, 2014).

Healthfulness may not directly equate to BMI changes, though there are clear physical (Wing et al., 2011) and psychological (Ross et al., 2009) benefits to weight loss. It appears prudent to state that while weight loss may not be the lone route to quality of life improvement and enhanced wellbeing, it is a useful clinical target for overweight and obese adults. In developing a comprehensive, evidence-based intervention for overweight and obese young adults, it is crucial to conceptualize and target both health behaviors themselves (e.g., eating more healthily, being more physically active), the manner in which those behaviors are facilitated (e.g., connecting with values, working to build new behaviors into daily routines), and a stronger focus on healthfulness than thinness.

Acceptance as Alternative to Traditional Treatment

There is modest demonstrated efficacy of traditional control- and restriction-based weight loss interventions. Conventional BWL approaches have tended to demonstrate a trend of weight loss from pre- to postintervention, with slow weight gain to initial weight or beyond. As such, an alternative conceptualization utilizing acceptance- and mindfulness-based approaches may be warranted. Such a conceptualization can be found in the examinations of ACT (Forman & Butryn, 2015; Hayes et al., 1999). One central emerging benefit of ACT therapies is better maintenance of treatment effects (Forman et al., 2009; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Niemeier et al., 2012).

ACT differs from other traditional cognitive-behavioral interventions in several important ways. Paramount among these theoretical differences is the assumption that human suffering results not merely from the presence of difficult or painful internal

cognitions and emotions, but rather emphasizes the importance of an individual's relationship to those experiences as a source of suffering. In that spirit, the therapeutic target of ACT can be described as the enhancement of *psychological flexibility*, which Kashdan and Rottenberg (2010) described as follows:

> Psychological flexibility actually refers to a number of dynamic processes that unfold over time. This could be reflected by how a person: (1) adapts to fluctuating situational demands, (2) reconfigures mental resources, (3) shifts perspective, and (4) balances competing desires, needs, and life domains. (p. 866)

The conceptualization of psychological functioning from an ACT framework requires the evaluation of functioning across the approach's six interrelated and interacting core processes: *Acceptance, cognitive (de)fusion, contact with the present moment, self-as-context, values,* and *committed action*. *Acceptance* refers to the extent to which an individual willingly and openly experiences thoughts, emotions, and physical sensations without attempting to avoid, manage, regulate, or escape them. *Cognitive fusion* refers to the process of buying into or accepting the literal content of the thoughts an individual experiences. As such, the process targeted by an ACT conceptualization would be *defusion*, or unhooking from the content of cognitions and ability to experience cognitions more openly and flexibly without reflexively believing or responding to their content. *Contact with the present moment* closely resembles commonplace, contemporary definitions of mindfulness. Simply put, this process refers to spending time in the "here and now," or deliberately and consciously remaining focused in the ongoing events of "now" (Hayes et al., 2012). The fourth domain is *self-as-context*, or the extent to which an individual is able to conceptualize themselves as the context or location in which their internal experiences take place, rather than the content of the experiences themselves

(e.g., an individual who can have the thought "I am fat and unattractive" and notice the thought from the position of observer rather than automatically believing the content of the thought). *Values* and *committed action* are the fifth and sixth core processes of ACT. From an ACT framework, a psychologically flexible individual is able to clearly contact and define deeply held, meaningful beliefs that increase the reinforcing power of behaviors. For example, an individual may avoid any cause for automotive work because he/she finds it tedious or frustrating, though find helping a stranger with a disabled vehicle to be highly rewarding. The final process, *committed action,* refers to the extent to which an individual is able to freely choose behaviors consistent with their stated values and follow through with behavior patterns that reflect them. Figure 1, from McCracken and Yang (2006), portrays the ACT model of core processes and psychological flexibility as their ultimate goal.

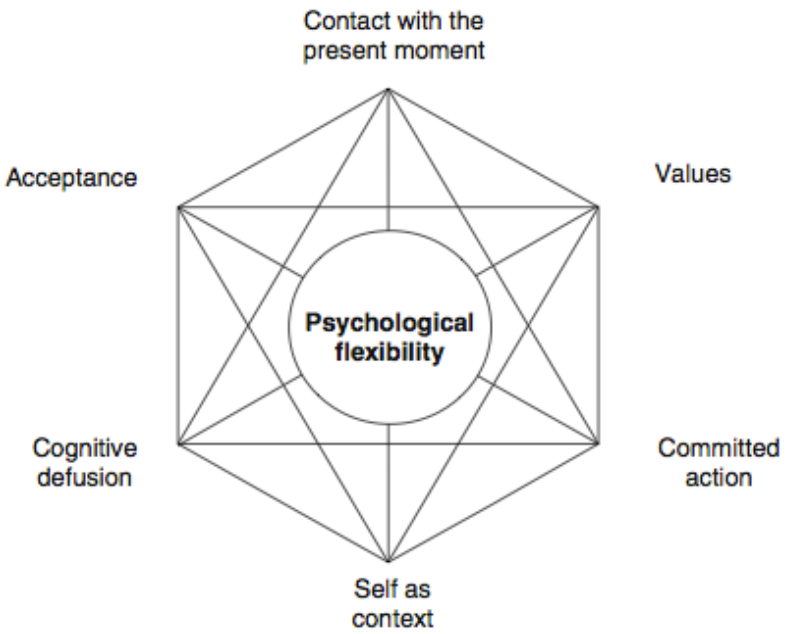

Figure 1. ACT model of psychological flexibility.

In the context of weight management, several important concepts must be highlighted. The process of willing and open acceptance of internal experiences is crucial in conceptualizing an ACT intervention for weight management. From an ACT framework, individuals experience psychological distress due to inflexible and pathological efforts to control, regulate, and escape uncomfortable psychological states (Hayes et al., 2012). In the case of weight management, and as described by previous research (Roehrig et al., 2009; Saules, Collings, Wiedemann, & Fowler, 2009), obese and overweight individuals struggling to maintain weight are likely to experience self-critical thoughts and hold highly judgmental and critical beliefs about their perceived inability to maintain healthy weight. When experienced from a psychologically inflexible stance, the individual is likely to engage in patterns of behavior to escape, avoid, or regulate these internal events (e.g., overeating, dieting, etc.). These attempts to manage the internal experience result in further distress and continued experiences of failure and defeat, thus reinforcing the problematic beliefs and cognitions and continuing the cycle of suffering.

In an important conceptual study, Forman and Butryn (2015) provided an exhaustive rationale for the use of ACT in the management of weight. The authors stated that even though cognitive behavioral interventions have been shown to be effective in the short term, they are limited in long-term efficacy because participants fail to adhere to principals taught in any therapeutic intervention. Forman and Butryn hypothesized that this is due to the core target of these interventions, namely, to override biological and environmental cues to seek out high energy (high calorie), very tasty food, in favor of less rewarding, calorie-lean food. They went on to argue that although typical treatments

include skills such as self-monitoring and cognitive reappraisal, there is a lack of focus on comprehensive self-regulation. Acceptance and commitment therapy, the authors contended, offers a framework to provide the crucial aspects of an effective intervention for weight management.

Forman and Butryn (2015) went on to highlight three requisite cognitive and behavioral processes that they support by a plethora of empirical studies. First, effective cognitive behavioral interventions for overweight and obesity must include clarity of values and comment to values-linked behavioral goals. Essentially, unfamiliar and uncomfortable choices (e.g., eating unfamiliar or less calorie-dense food, exercising) are better able to be consistently made and reinforced when clearly linked to deeply held values. Second, interventions must include enhancement of metacognitive awareness. Specifically, without clear access and awareness of one's own cognitive processes, individuals are likely to engage in automatic and mindless lifestyle behaviors (e.g., hedonic eating, exercise avoidance). Interventions must cultivate an increased awareness of one's decision-making processes and moment-to-moment insight of those processes taking place. Finally, Forman and Butryn (2015) asserted that effective cognitive behavioral intervention must include the "ability to tolerate experiential distress and reduction in pleasure" (p. 173). Making changes is inherently uncomfortable, especially when those changes are fundamentally opposed to powerful biological and contextual cues to seek high energy, highly rewarding foods, and also engage in physical activity that may be both physical and/or psychologically painful. Efficacious treatments, the authors stated, must supplement awareness and insight with skills to tolerate discomfort

in the present moment to allow individuals to sufficiently interrupt automatic cognitive and behavioral processes and establish new, valued patterns of behavior

Lillis and colleagues (2009) implemented an acceptance- and mindfulness-based ACT workshop to individuals that had undergone six months of a traditional, inpatient structured weight loss program. In this investigation, Lillis and colleagues randomly assigned 87 individuals to either a 6-hour ACT workshop or wait-list control. More than one third (35%) of the experimental condition participants in this study lost more than 5 pounds, with an average loss of 1% from pretreatment to 3-month follow-up. Control participants gained roughly the same amount over the same period of time. This study differed in that the individuals had already undergone 6 months of inpatient weight loss treatment, so the modest loss and maintenance of previous losses is notable and significant. In addition to showing weight maintenance outcomes, Lillis and colleagues found that several important psychological indicators of well-being (e.g., weight-related stigma, perceived quality of life) were also positively impacted by the intervention. Interestingly, the authors showed that these psychological benefits occurred even in the absence of weight loss, suggesting that benefits may be somewhat independent of body mass.

An acceptance-based approach to behavioral intervention in weight management has some promising empirical support. Forman and colleagues (2009) conducted a 12-week open trial of an ACT intervention to behavioral and psychological components of weight management. Utilizing a single group design, Forman and colleagues demonstrated that the 19 participants that completed the 12-week intervention lost greater

than 6% of their body weight on average. Intriguingly, and perhaps most importantly in the ongoing study of behavioral weight loss programs, the 14 individuals available for follow-up continued to lose weight after the intervention. At 6-month follow-up, the participants had lost an additional 3%, for an average total of 9.6% lost.

Katterman, Goldstein, Butryn, Forman, and Lowe (2013) compared a brief mindfulness- and acceptance-based intervention to an assessment-only condition in a sample of overweight (M_{BMI} = 26.5) young adult women (M_{age} = 22 years, range = 18-29) to prevent weight gain. The intervention consisted of eight group sessions over 16 weeks and covered topics such as self-monitoring and exercise, as well as distress tolerance and mindfulness skills. The results were encouraging, showing that experimental participants lost approximately 2% of total body weight by the end of the 16-week intervention while control condition participants gained approximately 1.5%. While the initial weight loss was modest, participants in the experimental condition continued to lose weight, showing an average loss of 3.2% at 1-year follow-up (after approximately 36 weeks without contact or intervention). During the same period, 58% of assessment-only participants gained at least 2.2kg (3.1% of total body weight).

A recent pilot investigation again demonstrated strong efficacy for an ACT conceptual framework in the treatment of obesity within a group of adults with high cognitive and behavioral automaticity with regard to food (so-called “emotional eaters). Niemeier and colleagues (2012) conducted a pilot study within a hospital context. Individuals in this study (N = 18, M_{age}= 52.2 years) participated in 1-hour weekly sessions focused on acceptance, mindfulness, and behavioral techniques in response to

painful emotions and thoughts (i.e., emotional eating). Participants were provided a brief psychoeducational introduction into standard methods of behavioral weight loss (e.g., goal setting, self-monitoring, reducing percentage of calories from fat). Subsequently, participants completed 24 weekly group sessions with assessments at baseline, posttreatment, and 3-month follow-up. After 24 weeks of intervention, participants lost an average of 12kg (13.5% of total body weight). Importantly, at 3-month follow-up, these changes were maintained (12.1 kg lost). However, a limitation of this study is that it did not include a control group for comparison.

In addition to outcome studies, ACT processes have been studied in the context of weight management. Forman and colleagues (2009) and Niemeier and colleagues (2012) were able to examine the role of psychological process variables in weight management. Specifically, the theorized mechanisms of action (e.g., cognitive flexibility) tended to predict weight loss. The researchers found that an ACT intervention was effective at reducing disinhibition (e.g., eating related to negative affect), cognitive restraint, perceived hunger, weight-related experiential avoidance, and increased distress tolerance. In addition, and important for ongoing intervention research, Niemeier and colleagues found that changes in weight-related experiential avoidance accounted for greater than 40% of the change in weight at both posttreatment and 3-month follow-up. In a conceptual paper, Lillis and Kendra (2014) discussed some potentially important collateral benefits of ACT in the treatment of overweight and obesity, such as reduced weight stigma, improved body satisfaction, and increased physical activity, in addition to weight itself.

It should be noted that both Forman and colleagues (2009) and Niemeier and colleagues (2012) utilized a single-group format. In the case of the Forman and colleagues' study, possibly due to the open trial format, there was a high rate of attrition, requiring caution in interpreting the obtained results. Similarly, Niemeier and colleagues looked only at adults receiving an active intervention and did not compare to any form of control. In order to continue establishing the efficacy of ACT-based interventions in the treatment of obesity, additional studies are needed. Finally, both the Niemeier and Forman studies utilized interventions that may not be practical or even possible in the contexts of community mental health or primary care (Gopalan et al., 2010). While the available results appear promising, questions remain regarding the populations, settings, durations of intervention, and efficacy in relation to a control group.

While there are few weight management studies that have utilized a brief ACT protocol, promising results can be seen in related behavioral health treatment studies. Gregg and colleagues (2007) conducted a 1-day ACT workshop in conjunction with psychoeducation for individuals diagnosed with Type 2 diabetes. Individuals received approximately 4 hours of diabetes education and approximately 3 hours of ACT. Gregg and colleagues found that those participants in the ACT + education group reported better use of coping skills, better self-reported diabetes self-care, and improved metabolic medical indicators (e.g., self-reported diabetes self-care, measured HbA_{1C} within target range) at 3-month follow-up.

Conclusions from Review of Literature

Obesity and weight-related health problems present significant costs to both individuals and society. Individuals struggling with obesity and related conditions have a higher rate of life-threatening health impairments, as well as a plethora of psychological impacts that greatly reduce quality of life. To date, medical and behavioral interventions have been modestly successful in reducing weight and maintaining weight loss. Traditional cognitive behavioral interventions often demonstrate weight loss during intervention but perform poorly in maintaining those losses. Emerging evidence (e.g., Forman et al., 2009, Lillis et al., 2009; Niemeier et al., 2012) suggested that acceptance- and mindfulness-based approaches may be effective for achievement and maintenance of weight loss, through values clarification, distress tolerance skills, and metacognitive awareness.

Studies utilizing ACT have shown to improve health behaviors, improve WRPF, and reduce impact of weight on quality of life irrespective of weight loss. However, no studies to date have compared a *bona fide* ACT intervention and randomly assigned information control in emerging adulthood. In addition, effective studies have included up to 24 months of intervention, which may be less useful in contexts requiring briefer intervention. Given the high prevalence of obesity and related health condition and increasing demand for focused and specific treatments, such an intervention would need to be brief, acceptable to patients, and able to be efficiently implemented across behavioral healthcare environments. The current prospective investigation aimed to address these needs derived from the current empirical literature.

The present randomized control trial consisted of a brief, acceptance- and mindfulness-based behavioral intervention utilizing skills and conceptual framework of ACT that have previously shown to effectively improve lifestyle health behaviors and facilitate weight loss in the overweight and obese (Forman et al., 2009; Lillis et al., 2009, Niemeier et al., 2012). Targeted skills were meant to address the dysfunctional cognitive dimensions and behavioral patterns observed in obese and overweight populations. Specifically, the intervention was designed to provide individuals with enhanced ability to openly, willingly, and flexibly experience discomforting internal experiences, work toward willingness to experience those thoughts and emotions in the service of living a valued life, and engage in deliberate and thoughtful decision making consistent with one's stated goals and values. By reducing the extent to which individuals utilized unhealthy lifestyle behaviors to regulate, manage, or avoid their painful internal experiences, the intervention may allow increased capacity to consistently engage in valued living and increase access to reinforcement in the environment. It was hypothesized that this approach would be effective at addressing the cognitive and behavioral patterns within the overweight and obese population by providing them with an alternative cognitive behavioral paradigm through which to experience painful thoughts and emotions. To determine the efficacy of this approach in a young adult population, individuals were randomized to either an experimental condition or information control.

The primary purpose of this study was to develop and evaluate a brief, group-based ACT intervention to be implemented within a sample of young adults (ages 18-30

years) and compare this with a randomly assigned psychoeducational information control group. The *first objective* of this study was to assess the utility of a brief, group-based ACT intervention in impacting (a) lifestyle behaviors (i.e., eating patterns and physical activity level), (b) psychological process variables previously shown to relate importantly to these behaviors, and (c) BMI. The *second objective* was to evaluate the relationships of ACT-related psychological constructs (e.g., psychological flexibility, emotionally avoidant eating, valued living) with dietary intake, physical activity, and lifestyle behaviors. The *third objective* was to evaluate the ability of changes in these psychological process variables to predict changes in eating behavior, physical activity, and quality of life.

Research Questions

This study addressed the following research questions related to each of the objectives.

Objective 1

1. Can a focused, ACT group intervention be shown to be more effective than information control at:
    a. Increasing WRPF
    b. Increasing physical activity
    c. Reducing impact of weight on quality of life
    d. Reducing emotional and uncontrolled eating
    e. Reducing BMI

Objective 2

2. What is the relationship of the weight of overweight/obese young adults and:
    a. Weight-related quality of life?
    b. WRPF?
3. What is the relationship of WRPF and:
    a. Daily caloric intake?
    b. Daily physical activity?
    c. Emotional/uncontrolled eating?
    d. Weight-related quality of life?

Objective 3

4. Do changes in WRPF relate to changes in:
    a. Daily caloric intake?
    b. Daily physical activity?
    c. BMI
    d. Emotional/uncontrolled eating?
    e. Weight-related quality of life?

CHAPTER III

METHOD

Participants

Sample Characteristics

Forty-three individuals completed initial interviews to participate in the study. Of those 43, two were excluded (one because she was in an active major depressive episode and another because of active suicidal ideation and recent substance use disorder). These two individuals were provided with alternative mental health treatment recommendations at the USU Counseling and Psychological Services office. One of the excluded individuals reported she was an existing client at this office with a scheduled appointment in the next week and the other individual was contacted one week after her initial study interview and verified by phone that she had established services with a mental health provider. Two other individuals completed screening interviews and were randomized to treatment condition but withdrew from the study prior to beginning groups due to scheduling problems. Finally, three individuals withdrew during the study and did not complete follow-up measures following the intervention or control period. The seven individuals who completed initial measures but did not complete the study did not significantly differ on any study variables from the remaining participants (all $p > .05$; see Appendix A for tables of these analyses). All remaining 36 individuals who completed initial measures completed all follow-up measures either following the groups or control period. Figure 2 shows the flow of participants at each point across the study.

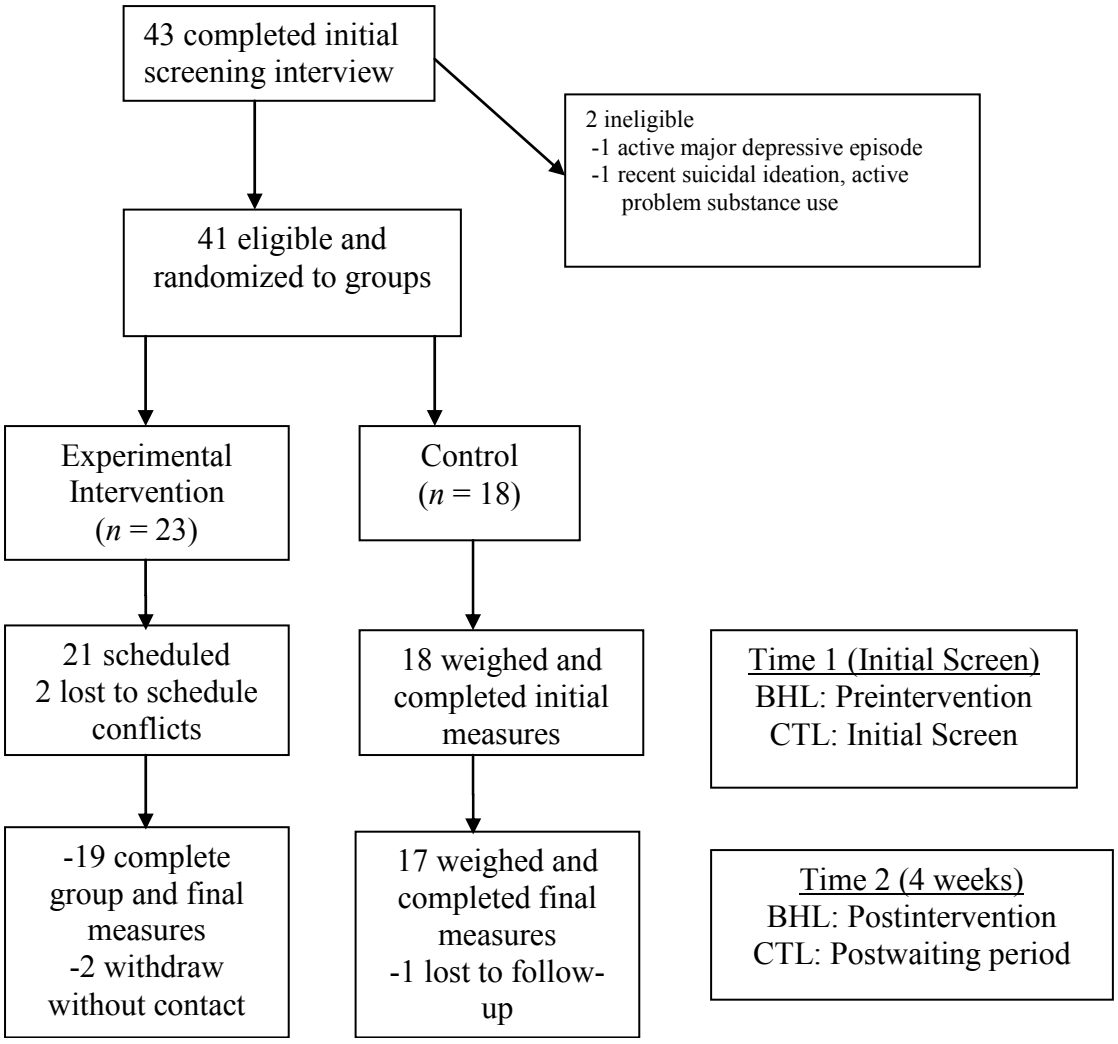

Figure 2. Participant flow.

Sample participants in this study were 36 adult male (n = 9) and female (n = 27) young adults between 18 and 29 years of age (M = 22.8, SD = 2.64). Biological sex was evenly distributed across conditions, $\chi^2(1) = 0.93$, p = .34. The sample was of limited ethnic diversity, with most participants (77.8%) identifying as White (n = 28). Of the remaining individuals, 11.1% identified as Latino/Hispanic (n = 4), 5.6% identified as Black/African American (n = 2), one identified as Pacific Islander/Polynesian (2.8%) and

one did not respond (2.8%). Ethnicity did not appear differ across condition, $\chi^2(1) = 0.89$, $p = .83$, although with such limited ethnic diversity within the sample, this analysis may be of limited utility. Control and experimental conditions also did not significantly differ on age ($M = 22.8$ years, $SD = 2.64$), prestudy weight ($M = 208.9$ pounds, $SD = 41.5$), height ($M = 66.7$ inches, $SD = 3.6$), BMI ($M = 32.8$, $SD = 4.5$), or prestudy minutes of weekly physical activity ($M = 90.4$, $SD = 107.42$), with all $p \geq .50$. Eleven individuals (30.6%) reported previous formal weight-loss program participation. Most of these participants had participated in programs such as Weight Watchers, South Beach Diet, or other structured diet plans. See Tables 1 and 2 for additional demographic information about study participants.

Table 1

Descriptive Statistics for Demographic Variables

Variable	Mean	*SD*	*t*	*df*	*p*	*d*
Age	22.81	2.64	.16	34	.87	0.06
Control	22.88	2.45				
BHL	22.74	2.86				
Weight	208.86	41.46	-.12	34	.90	0.04
Control	207.97	40.83				
BHL	209.66	43.01				
Height (inches)	66.65	3.55	.42	34	.68	0.14
Control	66.91	3.48				
BHL	66.41	3.69				
BMI	32.84	4.48	-.57	34	.57	0.20
Control	32.39	3.99				
BHL	33.25	4.96				
Minutes of PA (past week)	94.39	107.42	.63	26	.53	0.24
Control	107.37	112.20				
BHL	81.43	104.96				

Table 2

Ethnicity of Sample in Control and Experimental Conditions

	White		Latino/ Hispanic		Black		Pacific Islander/ Polynesian		No response				
Variable	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	χ^2	*p*	*Φ*
Ethnicity	28	77.8	4	11.1	2	5.6	1	2.8	1	2.8	.89	.83	.16
Control	13	76.5	2	11.8	1	5.9	0	0.0	1	5.9			
BHL	15	78.9	2	10.5	1	5.3	1	5.3	0	0.0			

Participants for the current study were recruited from a variety of locations within Logan, Utah, a medium-sized city (approximately 50,000 residents) within the Mountain West region of the U.S. and Utah State University (USU), a medium-sized (approximately 29,000 students) public university whose main campus is located in Logan. Recruitment efforts were focused on gathering cohorts of approximately 10-15 participants at a time in order to randomize to control and experimental conditions in groups of approximately 5-8 per group. Recruitment materials were placed in presumed highly visible public communication areas around both the USU campus and Logan. On campus, locations were chosen to maximize visibility (i.e., areas with frequent and high density student traffic) and those most likely to be seen by individuals who may be interested in eating more healthfully (e.g., cafeterias) or being more active (e.g., fitness centers, physical education building). In order to combat some of the effects of convenience sampling for young adults in a university community, attempts were made to distribute recruitment materials (e.g., flyers, informational leaflets) in several different types of public locations in the community. In order to increase probability of sample

diversity, public locations were selected that were more likely to contact potential participants from widely varying backgrounds (e.g., grocery stores, large retail stores). In addition to paper and electronic announcements on campus, study staff completed radio interviews, newspaper interviews, and class presentations in order to boost recruitment. Nevertheless, recruitment was a challenge in this study and thus the sample size was smaller than originally planned and proposed for this project.

All participants in this study were self-referred. Many of the participants were provided basic information about the study via their behavioral health and medical providers across several campus health service offices (e.g., Student Health and Wellness Center, Counseling and Psychological Services, Biomedical Services, Psychology Community Clinic). Study personnel presented information about the study to providers in these offices, often during staff meetings. Referring providers were not compensated for their provision of contact information to potential participants and did not have access to participant contact, data, or progress in the intervention. At the point of referral, individuals were invited to participate in "an investigational lifestyle enhancement program" offered by the Department of Psychology at USU to assist individuals struggling to lose weight, achieve fitness goals, or maintain healthful eating. They were provided a phone number and email address of the primary investigator in order to establish contact. Campus health providers did not make direct referrals to study personnel; all potential participants were simply given contact information and basic information about the study, and encouraged to contact the primary researcher if interested.

In order to protect privacy of the principal investigator and effectively manage documentation of communication with participants, a mobile application was utilized (Google Voice, http://www.google.com/voice). Utilization of Google Voice allowed the principal investigator to manage incoming emails, phone calls, and text messages without giving out personal telephone number or email information. This application allowed the primary investigator to communicate with participants and gather information without personally identifiable information (e.g., names) and to later cross-reference incoming phone numbers with the encrypted file used to store such personal information.

Inclusion and Exclusion Criteria

Individuals were considered eligible for the study based on several criteria. Consistent with Niemeier and colleagues (2012), individuals were included if they had a recorded BMI between 27.0 - 45.0kg/m^2. In addition, this study targeted emerging adults. Participants were included between the ages of 18 and 30 years, roughly the range that Arnett (2011) defined as comprising emerging adulthood. Both men and women were recruited for participation. In order to reduce confounding factors and reduce risk of harm, participants were excluded if they presented with: (a) severe depression (defined as presence of an active major depressive episode); (b) active eating disorder or having met DSM-IV-TR criteria for an eating disorder within the past 12 months; (c) psychosis/ disordered thinking; (d) acute suicidal ideation, planning, or intent; (e) apparent Axis II symptomatology; or (f) active substance use disorder. These were assessed with an abbreviated version of the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). Individuals were not excluded for subclinical binge eating behavior (i.e.,

endorsing some binge eating without meeting criteria for an eating disorder) as they have been found to respond to intervention similarly to those without diagnosed binge eating disorder (Peterson et al., 2011). Finally, all individuals participating in the study were screened out if currently engaging in any other weight loss or weight management programs (e.g., Weight Watchers) or structured diet plans. To the extent possible, individuals were representative of the general population of young adults who may present to outpatient treatment providers for weight management intervention. The sample was drawn with the intent to generalize findings broadly to the overweight and obese populations of emerging adults in the U.S.

Procedure

Once individuals contacted the primary researcher or study assistants, they were scheduled for a 60-minute initial intake and screening interview to evaluate interested individuals for inclusion/exclusion criteria and complete pre-study measures. The study representative contacted potential participants by phone, email, or text message (determined by mode of contact of participant) to schedule a screening interview. These meetings were scheduled for 1 hour and had the following schedule: (a) provide informed consent and alternative options, (b) complete prestudy survey measures, (c) gather height and weight, (d) complete mini screening interview, (e) assign to treatment condition, (f) explain study procedures and demonstrate how to use the ASA24 dietary tracking website, and (g) provide psychoeducational material. All participants were provided a brief psychoeducational supplement detailing basic dietary and activity guidelines and the

basics of eating healthfully (see Appendix B). Participants were instructed that they were responsible for determining their own physical suitability for light, self-directed physical activity, which was explained in informed consent. All participants were advised to consult with their primary care providers to address questions regarding suitability for physical activity and were liable for monitoring their own physical care. Only individuals with BMI between 27.0kg/m^2 and 45.0kg/m^2 were included in order to minimize potential health risks of unmonitored exercise of severely obese individuals, consistent with guidelines in previous research (e.g., Niemeier et al., 2012).

Group Assignment

Of the 43 screening interviews conducted, 42 were conducted by the principal investigator (Richards) and one was conducted by an assistant student researcher (Potts). At the screening interview, individuals who met inclusion criteria were assigned a unique study ID and were assigned to a treatment condition. A list of 50 randomly generated three-digit numbers was generated using an online random number generator (http://www.random.org). Individuals were instructed during informed consent that they would be randomly assigned to either a group that would start immediately (experimental group) or a group that would start in 4 weeks (control group). Participants were assigned a number in the order they contacted study personnel. Those assigned an odd number were assigned to control condition and even numbers were assigned to experimental condition. Those assigned to the experimental condition given a schedule provide their schedule availability in afternoons and evenings. Study personnel selected group times based on the schedules provided by participants. In two cases, individuals assigned to

treatment condition were precluded from beginning participation immediately because of schedule conflicts with other group members. These individuals were reassigned to control condition and provided the intervention at a later date. While this is recognized as a potential threat for true random assignment, it was done in an effort to maximize inclusion and retention of interested participants.

All participants assigned to the control condition were offered the experimental intervention following their 4-week information control period. At the conclusion of the control period, study personnel contacted control group participants to schedule a "follow-up meeting" to gather updated data and schedule them for the next available group, if they were interested. Only one control participant elected not to participate in the intervention due to problems coordinating schedule.

Incentive

Participants were offered an incentive to complete the intervention. Participants were made aware that after successful completion of at the study (including completing pre- and posttest measures), they would be entered into a drawing for a $25 gift card to a local retail store. A raffle was conducted using completed entries into the ASA24 food logging system. For each completed ASA24 entry pre- and postintervention (or pre- and postcontrol period), participants were entered one ticket into a raffle (a maximum of six total entries). Participants' contact information was collected after completion of preintervention measures to enter the drawing. One $25 gift card was offered per wave of participants in both control and experimental conditions. Participants were offered incentives for completion of assessments, not for completion of the intervention itself.

Treatment Protocol Development

The content of the experimental intervention was based on topics/techniques that have shown to be efficacious in weight management treatment of obese individuals (Lillis et al., 2009; Niemeier et al., 2012). Dr. Heather Niemeier shared the clinician and participant materials from her 2012 study, which were adapted for the current study goals and tailored for brief intervention. In addition, a treatment manual from an NIH grant-funded intervention (Afari, 2014) was utilized in support of treatment protocol development, as the group in that ongoing study is also a four-session intervention, though targets a individuals with diagnosed binge eating, rather than a general population of overweight adults. The provisional content of the treatment protocol was initially explored in workshop format at a USU Counseling and Psychological Services workshop series. The workshop was conducted by the principal investigator of this study and materials were sampled from that workshop to the current protocol. While no health outcome data were collected at that time, the 2-hour workshop was found to be highly acceptable by participants. Subsequently, the principal investigator further explored utility of the materials in individual psychotherapy sessions, under the supervision of a licensed psychologist, across multiple treatment settings and formats. The content found to be most effective was compiled, along with input from the protocols of Afari (2014), Lillis and colleagues (2009), and Niemeier and colleagues (2012) into a four-session format. Finally, after development of the four-session format, the draft sessions were subjected to expert review and revision from two licensed psychologists and experienced intervention psychological researchers familiar with ACT intervention studies, prior to

acceptance of the final version of the protocol. See Appendix E for the complete materials for the treatment protocol and participant handouts used in this study.

Intervention

The experimental condition consisted of four weekly 90-minute group sessions within a community clinic housed by the department of psychology USU. These sessions followed the subsequent order and included the following topics.

1. *Introduction, creative hopelessness, introduction to mindfulness*. Participants explored their previous weight-loss efforts and explore the utility and efficacy of their efforts. This session aimed to facilitate creative hopelessness and define control as the problem and introduce willingness and flexibility as approaches that can replace previous strategies. Participants learned the nature of thoughts and the problems with relying on them as the only source of evidence about their experience. During this session, clients were introduced to mindfulness both didactically and experientially with a mindful eating exercise. Session concluded with homework related to values and participants were given a sample daily food and exercise tracking sheets. Participants were instructed that these tracking sheets would not be collected but were samples for them to use if they desired to track independently.

2. *Willingness, mindfulness, control as the problem, values*. Session 2 reviewed mindfulness and focused on learning about the traps of inflexible approaches to wellness (e.g., dieting programs and rule-based eating, good vs. bad food, etc.). This session reviewed triggers, including internal and external triggers to unhealthful eating. Topics also included practicing experiencing discomfort, experiential exercises in sitting with

difficult thoughts. This session introduced committed action in the form of increasing exercise during the week (i.e., "Step Forward"). In addition, this session included introduction to cognitive defusion and mindfulness, including thought watching and experiential defusion exercise.

3. *Values, defusion, and committed action*. This session revisited mindfulness and values. Experiential exercises included connecting an avoided behavior to a value and mindful body scanning. The emphasis on this session was making values clearly chosen and exempt from scrutiny. Topics also included how thoughts cause people to *appear* to value something (e.g., thinness, perfection) but can link to stigma and self-deprecation. Increasing commitments to exercise and completing a values homework.

4. *Committed action, self-as-context, values, relapse prevention*. The final session reviewed material learned up through this point and continued into committed action. Session included a brief introduction to self-as-context as it relates to defusion. This session covered ongoing evaluation of behavior with regard to their utility *in the service to values* rather than how whether the behaviors were "good," "bad," or "what my mind says one *should* do." Recognition of warning signs and the temptation of "slippery slope" and typical barriers to change. There was a focus on acceptance and coping, using them effectively and when to use each. Individuals complete verbal and written behavioral commitments and reviewed resources for continued support.

Following completion of the final session, participants were weighed and completed postintervention measures. They were also given review instructions on how to complete ASA24 entries and instructed to complete three entries when contacted over

the subsequent week. They were given forms to keep record of their physical activity and told to record that over the next week as well.

Control Condition

For the information control condition, individuals completed an equivalent screening interview as experimental condition participants. Control participants were told they would receive the same intervention, though they would be starting in approximately one month. They were provided identical psychoeducational materials as the intervention group. Those individuals randomly assigned to the control were contacted approximately one week prior to intervention groups beginning to complete follow-up measures and weigh. At this follow-up appointment, control participants were also instructed to complete three additional ASA24 entries over the subsequent week (on dates chosen by the researchers). All control group participants were offered the option to complete the intervention following their one-month waiting period, with 10 of the 17 individuals participating.

Psychoeducational Materials

All participants in both conditions received a packet of psychoeducational materials related to healthful eating habits and physical activity recommendations. These materials were drawn from free, online resources by the CDC. In addition, participants were provided a sample daily food and physical activity tracking sheets, such to facilitate self-monitoring of eating and exercise behavior if they chose. Daily monitoring is recommended by the CDC, USDA, and the Academy of Nutrition and Dietetics (AND,

2012). See Appendix B for these materials.

Data Collection

Data were collected at several time points: Initial screening/consultation, prior to session one, and after session four. Figure 3 presents a summary of the information collected at each time point.

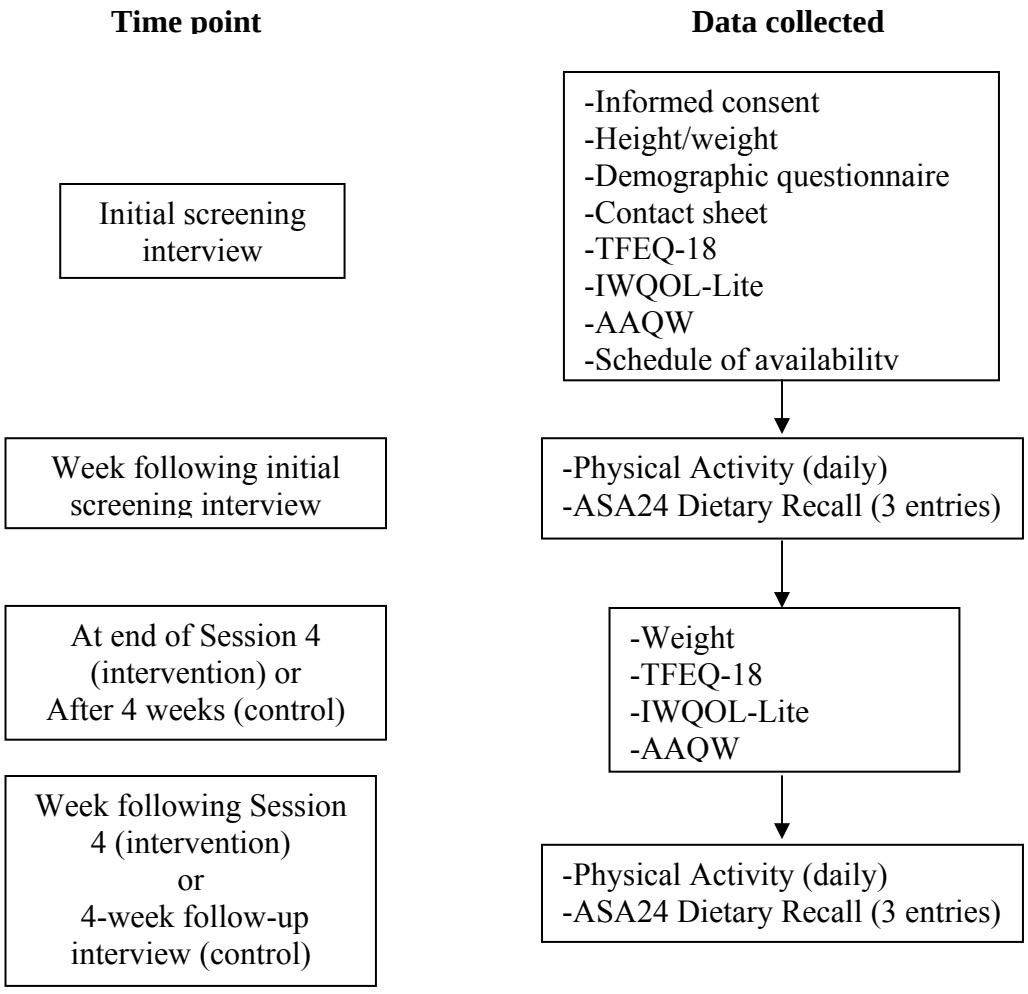

Figure 3. Data collection procedure across time.

Measures

Demographics and Contact Information

In order to ascertain basic demographic information, each participant completed a one-page demographic questionnaire. Participants provided information regarding age, biological sex, ethnicity, education level, and other demographic items. This was done in order to provide sample description and also to estimate the efficacy of randomization across demographic domains.

In addition to the demographic questionnaire, participants completed a very brief form including their contact information and preferred method of contact (e.g., email, text, phone). This was stored apart from all other data provided by participants. This procedure was followed in order to ensure that participants could be contacted by study personnel,

Quality of Life

Obesity-related quality of life (QOL) was assessed utilizing the Impact of Weight on Quality of Life Lite (IWQOL-Lite; Kolotkin, Crosby, Kosloski, & Williams, 2001), a 31-item self-report measure. The IWQOL-Lite measures life satisfaction and functioning across a number of domains including physical function (e.g., “Because of my weight I have trouble picking up objects”), self-esteem (e.g., “Because of my weight I don’t like myself”), sexual life (e.g., “Because of my weight I have little or no sexual desire”), public distress (e.g., “because of my weight I worry about fitting through aisles or turnstiles”), and work (e.g., “Because of my weight I am less productive than I could

be"). Respondents rate each of the 31 statements from 1-5, with 1 indicating "Never True" and 5 "Always True" over the past week. It has been shown to be both reliable and effective in use with obese populations with sufficient sensitivity to detect changes in QOL at small changes in BMI (Beechy, Galpern, Petrone, & Das, 2012). The IWQOL-Lite has been shown to have very strong internal consistency with subscales ranging from α =.82-.94 and total scale α = .96 (Kolotkin & Crosby, 2002). Test-retest reliabilities were also acceptable (.82-.94). In the current investigation, the total score was utilized in subsequent statistical analyses. The coefficient alpha for the total scale was 0.83. The IWQOL-Lite was used with permission and license of the author. For additional information about the measure, Dr. Kolotkin can be contacted with the following information: Ronette L. Kolotkin, Ph.D., Obesity and Quality of Life Consulting, 1004 Norwood Avenue, Durham, NC 27707, USA; (919) 493-9995; Fax: (919) 493- 9925 (email address: rkolotkin@yahoo.com)

Weight-Related Psychological Flexibility

The Acceptance and Action Questionnaire for Weight-Related Problems (AAQW; Lillis & Hayes, 2008) was also utilized to measure WRPF. This process-focused self-report measure includes 22 items on a 7-point Likert scale and includes items across a number of ACT-consistent processes. For example, the AAQW measures acceptance of weight-related thoughts and emotions, as well as the extent to which they interfere with valued living (e.g., "I try hard to avoid feeling bad about my weight or how I look). While the AAQW is a measure of cognitive flexibility, items are intended to be scored such that higher scores indicate *less* flexibility (i.e., higher scores are consistent with

more problematic thinking). After reverse-coding five items, a total score is generated by summing item scores. Total scores yield a measure of weight-related psychological *inflexibility,* that is, higher scores indicate a greater level of dysfunctional cognition. While this measure is relatively new, it has shown strong internal consistency in previous research (α = 0.88; Lillis & Hayes, 2008). For the current investigation, internal consistency was also strong (α = 0.84). There are no published cutoff scores delineating *how* dysfunctional an individual's weight-related cognition and emotion must be clinically significant, nor any clear guidelines for how much change on the AAQW must be seen to determine clinical significance or reliable change. As such, for the purposes of this study, the reliable change index (RCI) was calculated for AAQW scores. The RCI has been used in analysis of AAQW scores in previous research (Weineland, Arvidsson, Kakoulidis, & Dahl, 2012).

Emotional/Dysfunctional Eating

Along with the amount of food intake and other dietary information, data were collected regarding the psychological processes noticed in eating. To assess this process, participants were administered the Three Factor Eating Questionnaire-18 (TFEQ-18; de Lauzon et al., 2004). The TFEQ-18 is a brief self-report measure with three process subscales related to eating: cognitive restraint, uncontrolled eating, and emotional eating and has been validated in obese populations. The subscales of this measure have been found to be highly internally consistent in adult samples (α = .83-.87; de Lauzon et al., 2004). Respondents identify the extent to which each of 17 statements applies to them from "Definitely true" to "Definitely false." Item 18 is a measure of perceived restraint in

eating (e.g., “eating whatever you want whenever you want it” and asks respondents to identify their perceived restraint from 1 (“eat whatever and whenever I want to”) to 8 (“constantly limiting food intake, never ‘giving in’”). The measure’s subscales were used in subsequent analyses in this study.

The cognitive restraint subscale (CR) contains six items and aims to measure the extent to which an individual engages in effortful restraint while eating (e.g., “I deliberately take small helpings as a means to control my weight,” “I consciously hold back at means in order not to gain weight,” “I do not eat some foods because they make me fat.”) The uncontrolled eating subscale (UE) contains nine items and measures feelings of powerlessness over eating or sensations during eating (e.g., “Sometimes when I start eating, I just can’t seem to stop,” “I get so hungry that my stomach often seems like a bottomless pit,” “Being with someone who is eating often makes me hungry enough to eat also”). Finally, the emotional eating subscale (EE) asks respondents to rate their eating behavior in response to emotions in three items (e.g., “When I feel lonely, I console myself by eating,” “When I feel blue, I often overeat”). The subscales showed strong internal consistency. Using Cronbach’s alpha, cognitive restraint ($\alpha = 0.82$), uncontrolled eating ($\alpha = 0.72$), and uncontrolled eating (0.82) all within acceptable limits.

Dietary Intake

Dietary intake data were collected and analyzed using the Automated Self-Administered 24-hour Recall (ASA24) system, 2011 version, developed by the National Cancer Institute in Bethesda, MD (Subar et al., 2012). The ASA24 has been used extensively in measuring the dietary intake of adults and is recommended as a standard in

automated dietary data collection (Baranowski et al., 2012; Subar et al., 2012). Participants were instructed to complete three multi-pass, guided 24-hour dietary recalls over the course of a 7-day period (when instructed by study personnel). Individuals were contacted via their preferred contact method (email, phone, or text message) and instructed to log onto the ASA24 website to complete a recall for the previous day. Each seven-day period included recalls on two weekdays and one weekend day. Methods used in the ASA24 (e.g., multi-pass, visual aids, probing specific questions) are outlined as best practice in assessing dietary intake by Beechy and colleagues (2012). Dietary variables of interest in this study include overall caloric intake (kcal), sugar, carbohydrates, sodium, total fat, and saturated fat, as previously outlined in dietetics literature as important in assessing healthful eating (Hinderliter, Babyak, Sherwood, & Blumenthal, 2013; Josse, Atkinson, Tarnopolsky, & Phillips, 2011).

Physical Activity

Participants also completed daily physical activity tracking sheets at two points during the study (pre and post). These sheets were handed out at the initial screening interview and participants were instructed to track the number of minutes of physical activity completed for the purpose of exercise, as well as the type of exercise. For the purposes of this investigation, only total weekly minutes of physical activity for the purpose of exercise are analyzed. See Appendix D for a full list of measures used in this investigation.

Treatment Integrity

In order to ensure fidelity to the treatment protocol and consistency across sessions, all sessions were video recorded for treatment adherence coding (see Appendix C). Sessions were randomly selected such that a representative portion of each intervention cycle was analyzed. A coding system was utilized that has previously been used to assess treatment competence and fidelity in ACT randomized control trial research (Plumb & Vilardaga, 2010). Sessions were reviewed by operationally defining ACT core processes (see Appendix B). The coding procedure ensured that 25% of the total sessions in the experimental treatment were coded, and that at least one session from each wave of intervention was analyzed. As there were five total waves and 20 total sessions, five of the sessions were coded. Two doctoral students coded the five sessions. The coders were trained in the coding scheme by a doctoral-level psychologist and intervention researcher who served on the supervisory committee for this project. The psychologist is an expert in the particular protocol and ACT intervention and verified competence of the two independent coders in the utilization of the treatment. The two doctoral students responsible for coding were not involved in any other capacity with the current study, data collection, or intervention groups. There were not given access to any personally identifiable information of any group participants.

Sessions were coded using 1-minute intervals from each coded session. During each 1-minute interval, coders endorsed whether or not ACT core processes were evident in the given section, and which ACT process(es) were present. Nonadherent items were also coded (e.g., thought challenging, suppression, avoidance). At the conclusion of each

session, the coder rated the therapist on an overall measure of adherence to the ACT model and overall therapist competency on a 5-point Likert scale, with 5 indicating the highest level of adherence/competency. Overall, therapist competence was highly rated (M = 4.00, SD = 0). With regard to the degree to which a process was covered in session, the following values were attached to rating: 5 = *occurred with high frequency and was covered in a very in-depth manner*, 4 = *occurred with relatively high frequency and was addressed in a moderately in-depth manner*, 3 = *occurred several times and was covered at least once in a moderately in-depth manner*, 2 = *occurred at least once and not in an in-depth manner*, and 1 = *the variable was never explicitly covered.* Means for the degree to which the various ACT processes were covered across the five sessions were as follows: Acceptance, M = 4.20 (s = 1.10); defusion, M = 3.60 (s = .89); self-as-context, M = 2.20 (s = 1.30); contact with present moment, M = 3.80 (s = 1.30); clarifying values, M = 4.80 (s = .45); committed action, M = 3.00 (s = 1.41). Average overall adherence was also high (M = 3.80, s = 0.45). These integrity scores were roughly commensurate with previously published ACT intervention research (e.g., Dehlin, Morrison, & Twohig, 2013).

There was a high level of session attendance across groups (M = 3.53, s = .77). Of the 19 individuals in the experimental condition, 68.4% (n = 13) attended all four sessions, 15.8% (n = 3) attended three sessions and 15.8% attended two sessions. A participant was considered to have completed the intervention if they attended a minimum of two sessions and completed measures at both pre- and postintervention. Final measures were always administered immediately following the final group.

CHAPTER IV

RESULTS

Scale Preparation

Measures were prepared for data analysis by recommendations outlined in their respective use manuals or publications that describe their intended scoring. For the IWQOL-Lite, per the measure's manual (Kolotkin & Crosby, 2011), a total score was calculated. While the measure includes several subscales (i.e., physical function, self-esteem, sexual life, public distress, and work), due to the relatively small sample in this study, only the total score of the IWQOL-Lite was utilized. In order to have a total score calculated, an individual had to complete at least 24 of the 31 items (> 75%). The item mean was calculated for each of the items to which participants responded and was multiplied by 31 to create their total scores. There was very little missingness among the items comprising this measure (1.3%), with the most frequently missing items falling within the sexual life subscale. While not asked specifically about this, several participants either verbally reported or wrote on their measure packets that they were not sexually active and did not answer the related questions. Others wrote that they were not sexually active and thus scored each item within the subscale as "never true," indicating no impairment. As there was no procedure outlined in the manual for this measure for how to handle data from participants who are not sexually active, these items were left in the calculation of the total score. Nevertheless, it is noteworthy that the scores from participants who are not sexually active may underrepresent apparent impact on quality

of life among the sample.

The TFEQ-18 was prepared using procedures outlined in de Lauzon and colleagues (2004). For the purposes of this study, research questions were pertinent at the level of subscale. The three subscales derived were in cognitive restraint (CR), uncontrolled eating (UE), and emotional eating (EE). Subscale scores have been correlated with eating behavior (e.g., de Lauzon and colleagues showed that individuals with higher CR scores correlated to more frequent consumption of vegetables and lower levels of sugar and French fries). Per instructions in the scoring manual, a minimum of 50% of the items must be answered to consider the scale complete enough for analysis. Again, very few items were missing in this scale (< 1%). An item mean was calculated for each item within the subscale and was multiplied by the number of items in the subscale to generate the subscale score. Scores were then transformed to a 0-100 scale to ease in interpretation, with higher scores indicating more of the relevant eating process reported (e.g., CR scores nearer to 100 indicate greater reported cognitive restraint about or during eating).

The AAQW was prepared using a similar method for the purpose of consistency. Again, very little item-level missingness was observed. After reverse-scoring five items, item means were taken for all participants completing at least 75% of the measure, which all participants did. These item means were then multiplied by 22, the total number of items, to create a total AAQW score. While mean item replacement is acknowledged to be a less than ideal method for managing missing data, because the level of missingness was so small (< 1% of total data points), the method was used to be consistent with other

data preparation procedures outlined above.

Descriptive Analyses Statistics

Table 3 shows descriptive statistics for IWQOL-Lite subscales and total scores, TFEQ-18 subscale scores, and AAQW scores for both control group participants and experimental (BHL) conditions. No statistically significant differences were observed between control and BHL groups on subscale scores or IWQOL total scores prior to intervention, with $t(34)$ ranging from 0.14 to 1.67, and all $p \geq 0.10$. Subscale scores are presented for informational purposes, though only IWQOL-Lite total score was used for further statistical analyses. Effect sizes are included (Cohen's *d*) and calculated by dividing mean differences by pooled standard deviations. RegardING the TFEQ-18 and AAQW scores, no significant differences were observed prior to intervention. However, some effect sizes were in the small-moderate range of effect, indicating that small sample sizes may be masking potential preintervention differences (e.g., self-esteem, emotional eating). There were two notable threats to randomization. In both cases, a participant originally assigned to the experimental condition was unable to attend the established group meeting time. In order to maximize utility of collected data, these individuals were moved to the control condition and offered the group at the next available time in order to keep them in the study and include their data in subsequent analyses. In both cases, individuals received group intervention at the next offering. However, it appears from comparisons across demographic and study variables prior to intervention that no significant differences between control and experimental conditions were observed.

Table 3

Descriptive Statistics and Initial Group Comparison of Preintervention IWQOL-Lite, TFEQ-18, and AAQW Scores

Variable	*M*	*SD*	*t*	*df*	*p*	*d*[a]
IWQOL – Physical functioning			.14	34	.89	.05
Control	21.45	6.22				
BHL	21.21	4.32				
IWQOL – Self-esteem			-1.67	34	.10	-.57
Control	24.06	5.07				
BHL	26.79	4.74				
IWQOL – Sexual life			1.07	34	.30	.37
Control	8.88	3.50				
BHL	7.53	3.74				
IWQOL – Public distress			-.40	34	.70	-.14
Control	8.18	3.40				
BHL	8.63	3.48				
IWQOL – Work			-1.14	34	.26	-.39
Control	6.88	2.52				
BHL	7.89	2.77				
IWQOL – Total			-.67	34	.51	-.23
Control	69.56	12.33				
BHL	72.35	12.44				
TFEQ-18 – Cognitive restraint			.16	34	.87	.05
Control	46.41	18.63				
BHL	45.32	21.62				
TFEQ-18 – Uncontrolled eating			.68	34	.50	.23
Control	59.56	12.74				
BHL	56.14	16.75				
TFEQ-18 – Emotional eating			-1.21	33	.24	-.42
Control	60.42	20.68				
BHL	70.18	26.20				
AAQW total			-1.10	34	.28	-.38
Control	88.24	16.26				
BHL	94.53	17.92				

[a]Cohen's d calculated by dividing mean differences by pooled standard deviation.

Random group assignment appeared effective as no statistically significant differences were observed across any examined study variables prior to intervention. In addition, as previously described in Chapter III, groups were roughly equivalent across demographic variables such as age ($t = 0.16$, $p = 0.87$), BMI ($t = -0.57$, $p = 0.57$), biological sex ($\chi^2 = 0.93$, $p = 0.34$), ethnicity ($\chi^2 = 0.89$, $p = 0.83$), physical activity prior to intervention ($t = 0.63$, $p = 0.53$), and previous experience with weight loss programs ($\chi^2 = 0.02$, $p = 0.89$).

Data Transformation

Nearly all study variables met assumptions of normality prior to data analysis. However, there was a significant positive skew observed with both pre- and postintervention/control measurements of physical activity. In both cases, there was a large observed range (pre: 0-360 minutes; post: 0-330 minutes) and a large number of participants reporting no physical activity at all (post: eight participants with no reported physical activity; post: nine participants with no reported physical activity). In both of these cases, data were transformed utilizing a natural log (ln) transformation. Visual scanning of the data appeared to improve normality of the distribution for subsequent analysis.

Missing Data

While there was very little missing data across most study variables (< 5%), there was a significant level of missingness in physical activity reports and nutrition reporting.

Consistent with previous literature (e.g., Beechy et al., 2012), there was a high degree of missingness observed in reports of physical activity at initial assessment (22.2% missing) and second assessment (22.2% missing). This occurred despite repeated efforts to improve the rate of response (e.g., incentives for submitting data, repeated phone calls/ emails/text messages from research team). In addition, significant difficulty was encountered in encouraging study participants to complete ASA24 reports of their dietary intake. At initial assessment, 25% of participants failed to complete any ASA24 entries (of the requested three entries) and 47.2% failed to complete any ASA24 entries following either intervention or control conditions. A descriptive analysis of dietary data is presented later in this section. However, these variables were not utilized for subsequent statistical analyses due their high level of missingness.

For self-reported physical activity, a multiple imputation procedure was conducted via the *R* statistical package (R Core Team, 2012*).* Five imputed data sets were generated with 50 model iterations used to generate each dataset. The data were then visually scanned for any clearly aberrant values (e.g., negative values, values dramatically exceeding the range of observed data), which were not found in any of the five imputations. Analyses resulted in five models (one for each imputation) and these were then summed and averaged. The mean obtained for each statistic was utilized in subsequent inferential analysis. While multiple imputation is recognized as a viable method for managing missing data across time points (Asendorpf, van de Schoot, Denissen, & Hutteman, 2014), we encourage caution in interpreting these variables due to an overall high level of missingness (> 20%) and a relatively small sample size.

Analysis for Research Question 1

Table 4 shows mean differences for main outcome variables from initial assessment to follow-up assessment (i.e., following 4-week waiting period or immediately following final session of the experimental condition). Means and standard deviations are presented for comparison across time.

The initial research question proposed was whether a brief, targeted, ACT intervention could be shown to be more effective than information control at (a)

Table 4

Means of Outcome Variables at Time 1 and Time 2 for Experimental and Control Groups

Variable	$M_{\text{Time 1}}$	$M_{\text{Time 2}}$	M_D (Time 1 - Time 2)	s_D	*d*
Control					
AAQW	88.24	81.35	6.88	12.70	.54
IWQOL Total	69.56	65.63	3.93	8.66	.45
TFEQ-18 CR	46.41	48.37	-1.96	11.61	-.17
TFEQ-18 UE	59.56	54.66	4.90	11.05	.44
TFEQ-18 EE	60.42	61.11	2.22	19.79	.11
BMI	32.39	32.32	.07	.47	.15
Weight (lbs.)	207.97	207.14	.83	3.13	.27
PA	107.36	64.85	37.70	163.41	.23
BHL					
AAQW	94.53	77.11	17.42	17.03	1.02
IWQOL Total	72.35	67.28	5.07	12.39	.41
TFEQ-18 CR	45.32	53.51	-8.19	15.20	-.54
TFEQ-18 UE	56.14	46.71	9.43	14.15	.67
TFEQ-18 EE	70.18	57.31	12.67	24.08	.53
BMI	33.25	32.85	.40	.61	.66
Weight (lbs.)	209.66	207.83	1.83	2.22	.82
PA	81.43	107.33	-19.23	109.29	-.18

Note. CR - Cognitive Restraint; UE - Uncontrolled Eating; EE - Emotional Eating; BMI - Body Mass Index; - PA - Physical Activity.

improving weight-related psychological flexibility (WRPF), (b) improving weight-related quality of life, (c) improving eating behavior, (d) reducing BMI, and (e) increasing physical activity. The five aspects of research question 1 were each analyzed via mixed-method analysis of variance (ANOVA) with one within-subjects factor of time (i.e., pre- and postintervention or control condition) and one between-subjects factor of treatment group (i.e., control condition or experimental group). As shown earlier in Table 4, there were some observed changes in outcome variables. However, to determine the significance of the changes, further inferential analyses were conducted.

Table 5 shows results of mixed-method ANOVAs conducted with study outcome variables. As may be seen in Table 5, main effects for time, group and an interaction terms for the time by group interaction are presented. There was only one significant time by group interaction and this occurred for the AAQW scores, $F(1,34) = 4.34$, $p = 0.04$, with a medium effect ($\eta^2 = 0.11$). While there was also a significant effect for time, interpretation of this main effect is not useful in light of the significant interaction. Figure 4 shows a graphical representation of the interaction observed in the mixed-method ANOVA comparing AAQW results. As shown, individuals in the experimental group (BHL) showed a greater degree of improvement on AAQW scores than did control participants. The significant decrease in AAQW scores was accompanied by a medium effect size ($\eta^2 = .11$), while the control group evidenced a smaller pre-post change.

On average, participants in the control group lost less than 1% (.07 on BMI scale) of total body weight. Similarly, experimental group participants lost approximately 1% (.40 on BMI scale). This does not reflect clinically meaningful change in weight in either

Table 5

Mixed-Method ANOVAs for Outcome Variable Scores at Time 1 and Time 2

Source	*SS*	*df*	*MS*	*F*	*p*	η^2
AAQW						
Time	2649.75	1	2649.75	23.09	.00	.40
Group	18.73	1	18.73	.04	.84	.00
Interaction	498.25	1	498.25	4.34	.04	.11
Error	3902.20	34	114.77			
BMI						
Time	.99	1	.99	6.62	.02	.16
Group	8.74	1	8.74	.22	.64	.01
Interaction	.47	1	.47	3.15	.09	.09
Error	5.11	34	.15			
Physical activity						
Time	1795.80	1	1795.80	.26	.69	.01
Group	5019.57	1	5019.57	.40	.61	.01
Interaction	23177.08	1	23177.08	3.55	.08	.09
Error	222656.66	34	6548.73			
IWQOL-total score						
Time	363.51	1	363.51	6.24	.02	.16
Group	88.30	1	88.30	0.35	.56	.01
Interaction	5.78	1	5.78	1.00	.76	.01
Error	1981.57	34	58.28			
Cognitive restraint						
Time	461.98	1	461.98	4.97	.03	.13
Group	73.92	1	73.92	.14	.71	.01
Interaction	173.92	1	173.92	1.87	.18	.05
Error	3157.70	34	92.87			
Uncontrolled eating						
Time	921.45	1	921.45	11.27	.00	.25
Group	579.42	1	579.42	1.81	.19	.05
Interaction	91.97	1	91.97	1.13	.30	.03
Error	2779.12	34	81.73			
Emotional eating						
Time	777.80	1	777.80	2.86	.15	.08
Group	242.42	1	242.42	.28	.63	.01
Interaction	793.37	1	793.37	2.68	.13	.07
Error	777.80	34	777.80			

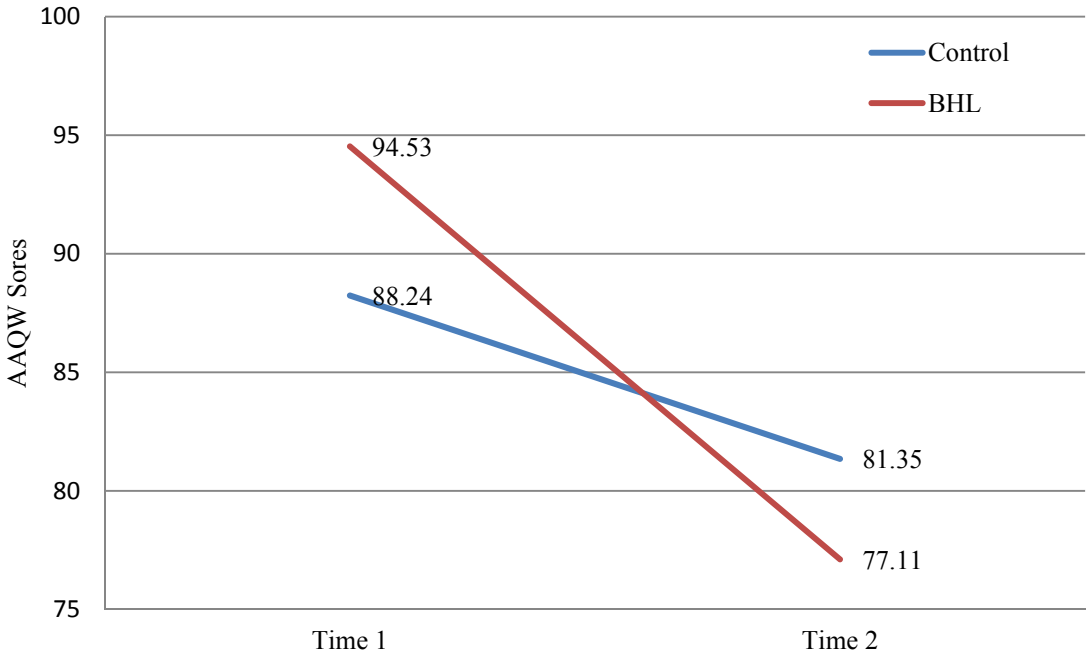

Figure 4. Interaction of group and time pre- and postintervention for AAQW scores.

group (i.e., standard of 5-10%; CDC, 2012). The ANOVA model that evaluated BMI change had a significant main effect for time. Participants across groups did demonstrate statistically significant reductions in BMI across time and the interaction terms approached statistical significance.

Participants in the control condition had M_D score of 37.70, indicating an average decrease of 37.70 minutes per week of physical activity for exercise (M_D calculated by $\sum(X_{\text{Time 1}} - X_{\text{Time 2}})/N$, so positive numbers indicate decrease in activity), a decrease of 35%. By contrast, experimental group participants showed an increase of 19.23 minutes per week (24%). There was no significant interaction effect for physical activity, though the interaction term did trend toward statistical significance ($p = .08$, $\eta^2 = .09$). Main effects for time were observed in models for IWQOL-Lite total score ($\eta^2 = .16$), CR ($\eta^2 =$

.13), and UE (η^2 = .25). Across groups, participants' eating process appeared to become more healthful and weight represented a statistically lesser impact on quality of life.

To summarize, the experimental intervention was found to improve WRPF, indicated by a statistically significant interaction effect in mixed-method ANOVA. All other group by time interactions were not statistically significant, although the interaction term for physical activity trended toward significance. Main effects for time were observed across groups for TFEQ-18 subscales of CR and UE, as well as for BMI. However, the change in BMI did not represent a clinically meaningful amount of weight (approximately 1% change).

Analysis for Research Question 2

Research question two pertained to relationships among certain study variables. In particular, this question aimed to explore previously reported findings about the relationship between weight and various domains of quality of life and psychosocial functioning (Kolotkin & Crosby, 2011). To address this question, bivariate correlations were conducted between weight of participants at entry to the study (in both groups) and IWQOL-Lite subscale scores. In addition, a correlation was calculated between weight and AAQW scores to explore what, if any, relationship weight had with WRPF. Those correlations can be found below in Table 6.

Upon examining bivariate correlations, the only IWQOL domain with which weight had a significant correlation was with public distress (r = 0.48, p = 0.003, r^2 = 23), which was statistically significant and had a large effect size. The higher the weight of

Table 6

Bivariate Correlations of Weight and Quality of Life Domains and AAQW

Variable	Pearson's *r*	*p*
Physical functioning	.17	0.32
Self-esteem	.06	0.69
Sexual life	-.08	0.67
Public distress	.48	0.00
Work	-.11	0.53
IWQOL-total	.20	0.25
AAQW	-.03	0.88

overweight and obese individuals, the greater extent they perceived weight to adversely impact them publicly. This subscale measures the extent to which individuals perceive that their weight adversely impacts their ability to function publically (e.g., "Because of my weight I worry about finding chairs that are strong enough to hold my weight") and also how they perceive that weight impacts other people's views of them (e.g., "Because of my weight I experience ridicule, teasing, or unwanted attention," "Because of my weight I experience discrimination by others.")

Because the public distress subscale was the only IWQOL-Lite subscale to correlate with weight, and did so by a large magnitude, the data were reviewed for outliers. Two participants reported unusually high public distress scores ($z > 2.5$). With these two individuals removed from the analysis, the relationship became nonsignificant, $r(33) = 0.31$, $p = .07$. Of particular note for this study is that weight did not significantly correlate with WRPF ($r = -0.03$, $p = 0.88$, $r^2 = <.001$).

Analysis for Research Question 3

Research question 3 examined process variable relationships for the hypothesized clinical mechanisms. Implicit in a clinical intervention using ACT is the assumption that relevant treatment outcomes are related to and influenced by psychological flexibility. The AAQW does not have clinical cutoffs per se. Rather, the AAQW (and similar measures of psychological flexibility) have previously been analyzed with the reliable change index (RCI; Jacobson & Truax, 1991). For example, Arch and colleagues (2012) used the RCI as a measure of meaningful treatment response with the acceptance and action questionnaire (AAQ; Bond et al., 2011), from which the AAQW was designed. Weineland and colleagues (2012) also utilized this procedure in analyzing treatment response with the AAQW. The RCI is intended to assess "clinically significant change in mental and behavioral medicine outcomes research" (Ferguson, Robinson, & Splaine, 2002). The RCI compares changes in group means relative to variability in change scores by using the formula $RC = (x_2 - x_1)/[\sqrt{2}(S_E)^2]$. An RCI score of > 1.96 is considered to be a change that exceeds the measurement error of the instrument of and is likely clinically meaningful. Table 7 shows the percentages of individuals in control and experimental conditions who had an RCI > 1.96 in their AAQW following their respective condition.

Table 7

RCI for Control and Experimental Conditions

	RCI > 1.96		RCI ≤ 1.96	
Condition	*n*	%	*n*	%
Control	8	47.1	9	52.9
BHL	15	78.9	4	21.1

While 47.1% of participants in the control condition showed clinically reliable change as reflected by their RCI, 78.9% of participants in the experimental condition showed reliable change in their AAQW scores. When compared, significantly more participants in the experimental condition experienced reliable change in their AAQW scores than in the control condition, $\chi^2(1,1) = 3.96$, $p = 0.047$.

The next step was to conduct bivariate correlation analyses between changes in measures of psychological flexibility and relevant clinical outcomes. Specifically, the following set of bivariate correlations (Table 8) examine the relationships between AAQW scores (WRPF) and weekly physical activity, uncontrolled eating, emotional eating, and overall impact of weight on quality of life.

Table 8 shows a relatively weak, non-significant correlation between AAQW scores and weekly physical activity. However, important for understanding eating process variables for these participants, highly significant ($p < .001$) positive correlations were observed between AAQW scores and uncontrolled eating ($r = 0.60$) and emotional eating ($r = 0.56$). In other words, individuals with greater weight-related psychological inflexibility (indicated by higher AAQW scores) reported more experiences of

Table 8

Bivariate Correlations of Baseline AAQW Scores and Outcome Measures

Correlating variable	Pearson's *r*	*p*
Physical activity	-.29	.14
Uncontrolled eating	.60	< .01
Emotional eating	.56	< .01
Impact of weight on quality of life	.59	< .01

uncontrolled and emotional eating. Higher AAQW scores also strongly correlated (r = 0.59, $p < .001$) with the degree to which weight was perceived to adversely impact an individual's overall quality of life. This finding suggests that for those individuals who are more literal and fused with their weight-related thoughts and who experience their weight-related thoughts as more powerful and more true generally report a lower quality of life.

Analyses for Research Question 4

Finally, research question four addressed relationships between change in WRPF and changes in process and outcome variables. Descriptive data for dietary intake at initial assessment and follow-up assessment for participants in both conditions are reported in Table 9. Due to limited rate of return on dietary outcomes, however, correlational analyses were not conducted.

It was important to determine if changes in individuals' WRPF translated to changes in physical activity, an important element of long-term physical health (Wadden & Butryn, 2003). In order to address this question, change scores were calculated by subtracting time two scores (either postintervention or postwaiting period) from initial scores for AAQW, BMI, physical activity, and TFEQ-18 subscale scores. Table 10 presents relationships between change scores in the AAQW with changes in physical activity. To aid in interpreting relationships, positive AAQW change scores indicate that a person has increased psychological flexibility (i.e., improved), as is the case with BMI and TFEQ-18 scores (i.e., positive numbers indicate more impairment at initial

Table 9

Self-Reported Dietary Information at Initial and Follow-Up Assessment

Nutrient	*M*	*S*	*df*	*t*	*p*	*d*
Initial						
KCal			25	.04	.97	.02
Control	2141.69	638.52				
BHL	2128.97	891.53				
Protein (g)			25	-.65	.52	.26
Control	73.91	27.23				
BHL	80.92	28.05				
Total fat (g)			25	-.27	.79	.11
Control	90.80	27.74				
BHL	94.28	36.28				
Carbohydrates (g)			25	.42	.68	.17
Control	265.75	108.30				
BHL	245.62	136.25				
Sugar (g)			25	.87	.40	.35
Control	123.73	84.12				
BHL	99.88	59.09				
Sodium (mg)			25	-.53	.60	.21
Control	3364.90	899.62				
BHL	3651.16	1698.57				
Saturated fat (g)			25	-.70	.49	.28
Control	30.77	14.29				
BHL	35.63	20.28				
Follow-up						
KCal			16	-.89	.39	.45
Control	1902.58	883.86				
BHL	2268.98	872.76				
Protein (g)			16	-.06	.95	.03
Control	88.62	37.17				
BHL	89.49	16.49				
Total fat (g)			16	-.55	.59	.28
Control	76.73	52.35				
BHL	87.38	25.75				
Carbohydrates (g)			16	-1.08	.30	.54
Control	216.88	96.00				
BHL	286.39	166.74				
Sugar (g)			16	-1.04	.32	.52
Control	92.02	45.57				
BHL	130.98	103.37				
Sodium (mg)			16	-.188	.85	.09
Control	3933.83	1998.91				
BHL	4075.47	1059.44				
Saturated fat (g)			16	-.35	.73	.18
Control	27.12	20.54				
BHL	29.77	10.32				

Table 10

Bivariate Correlations Among Change Scores in AAQW and Outcomes

Correlating variable	Pearson's *r*	*p*
BMI	.20	.25
Physical activity change	-.07	.76
TFEQ – Cognitive restraint	-.28	-.29
TFEQ – Uncontrolled eating	.67	.00
TFEQ – Emotional eating	.48	.01

assessment than at follow-up). The opposite is true with physical activity, with which negative numbers indicate improvement (i.e., more physical activity at follow-up than at initial assessment). Correlations described above are presented in Table 10.

Improvements in WRPF were associated with significant reductions in uncontrolled eating and emotional eating. Consistent with predictions, those individuals who improved in psychological flexibility also ate less mindlessly, more controlled, and less in reactive to emotions. The strongest observed correlation was with uncontrolled eating. No significant relationship was observed between changes in WRPF and changes in BMI or physical activity when collapsing across participants in both groups.

Summary

Results provided support for some aspects of the various research questions and failed to support others. The experimental intervention appeared to significantly and directly impact WRPF while the control condition did not. Weight itself correlated only with impact on public distress and did not significantly correlate with any other domains

of quality of life. Changes in WRPF significantly correlated with decreases in emotional eating and uncontrolled eating, but did not correlate with changes in weight or physical activity. Main effects for time showed that study participants across groups lost a statistically significant amount of weight though did not necessarily lose a clinically meaningful amount of weight (approximately 1% of preintervention weight). In order to more fully examine observed change in study variables across time, spaghetti plots were generated (Appendix F). No clear trends emerged from these graphs, perhaps due to limited sample size restricting subgroup comparison.

CHAPTER V

DISCUSSION

The results of the current study generally supported several aspects of the stated research questions. Broadly, the experimental intervention appeared to be partially effective at some of its hypothesized aims. Of particular note, this intervention did appear to directly impact psychological flexibility which is a fundamental hypothesized mechanism underlying ACT interventions (Hayes et al., 2012). In general, the intervention appeared more effective at improving WRPF than the information control condition. In addition, the results support the efficacy of a brief, targeted weight-related group intervention to improve WRPF with a general sample of young adults. Analyses of variance also showed nonsignificant but possibly meaningful trends in improvements in physical activity and BMI that likely would have reached statistical significance with a larger sample and greater statistical power.

It is not especially surprising that the participants in the experimental condition improved in their WRPF to a greater extent than control participants, and did so with a large effect size. Gregg and colleagues (2007) demonstrated the efficacy of ACT in producing large, meaningful effect sizes in health variables (e.g., diabetes outcomes) following brief intervention. In the present study, the experimental group focused every session on topics captured within the construct of WRPF (e.g., extent to which weight-related cognitions are believed versus experienced; extent to which thoughts impede on valued living) and very little of the psychoeducational material covered such topics. For example, in the CDC materials, there is a cursory discussion of how to improve habits

and reinforce positive behavior, though no acknowledgement of the involuntary nature of thoughts, the act of choosing not to buy into thoughts, or the ability to engage in values-consistent (i.e., healthy) behaviors in the presence of contradictory thoughts or painful emotions.

In a conceptual paper, Forman and Butryn (2015) asserted that effective interventions for weight needed to address three crucial areas: Insight into metacognition and decision making process; connecting healthful behavior change with values and establishing behavioral commitments consistent with those values; and learning skills to tolerate the discomfort of making difficult behavioral change. The authors argued that ACT could serve as an effective tool to implement these necessary components by specifically targeted the processes of values, cognitive defusion, connection with present moment, and committed action. Previous research (Forman et al., 2009; Niemeier et al., 2012) supported the utility of ACT as a *bona fide* first-line intervention strategy for overweight and obesity, though no such intervention studies had been conducted within the model of brief intervention. The results from the current study appear to lend support to the utility of a brief, targeted ACT intervention to improve WRPF, a construct that has been implicated in improving quality of life, weight reduction, and improved health behaviors (Lillis et al., 2009; Niemeier et al., 2012).

One somewhat counterintuitive finding was that a substantial percentage of control group participants with reliable improvement in (47.1%). This is of particular note because none of the psychoeducational materials specifically spoke to WRPF or even ACT-specific processes (e.g., mindfulness, defusion). It is not uncommon for

control group participants to improve prior to intervention. In fact, Hesser, Weise, Rief, and Andersson (2011) conducted a meta-analysis of wait-list participants enrolled in tinnitus studies and found a reliable, statistically significant improvement in self-reported symptomatology simply by waiting. The authors gave a number of possible explanations for their observed findings which may be relevant here. One such possibility is the item content-priming cue-recall hypothesis (Sharpe & Gilbert, 1998). This hypothesis asserted that when participants are initially presented with the content in self-report symptom measures, the presentation serves as a cue for negative affect and perception of symptoms. However, with repeated presentations, this effect may be somewhat lessened by habituation and thus the self-reported symptom intensity *at the time of the second administration* may be reduced simply by repeated exposure. This may lead a participant to report reduction in symptoms not because of actual improvement but simply by repeated exposure to the measure itself.

Another possible conclusion to be drawn from the observed effect in this study is that participants felt empowered by having begun a program that they expected to be helpful in managing their weight. In doing so, they may have viewed their thoughts and emotions about weight as less problematic or intense because they anticipated doing something productive to ameliorate them. Kam-Hansen and colleagues (2014) found that when prescribing providers presented anticipated effects of a pain medication placebo in a positive manner (in order to instill positive expectations in participants), that providing positive expectations incrementally increased placebo effect even if being told it was a placebo. This may bear even more meaning to the current study as participants were not

simply given placebo, but were given positive expectation in addition to useful psychoeducation to put into practice. However, from the currently obtained data, no definitive conclusion can be drawn.

The overall amount of weight loss observed in participants that completed the experimental intervention (approximately 1.2%) was roughly commensurate with that observed in Katterman and colleagues (2013), which also provided a similar amount of total intervention. Similar to the conclusions of Katterman and colleagues, however, the current study leaves unanswered whether obtained changes in weight-related cognition and behavior may persist over time. Similar ACT-based interventions have yielded enduring treatment effects with overweight and obese adults (e.g., Gregg et al., 2007; Niemeier et al., 2012), and in some instances treatment gains actually have increased in follow-up measurements (Forman et al., 2009).

In their review, Katterman, Kleinman, Hood, Nackers, and Corsida (2014) discussed the evidence for mindfulness-based interventions in the treatment of obesity. Katterman and colleagues stated that in their review of literature, only five previous studies utilizing mindfulness-based approaches had evaluated emotional eating. Of those, only samples that had been specifically recruited because of demonstrated problems with emotional eating had improved in this regard. The current study is unique in its tentative support of a brief ACT intervention to target WRPF and have improvements in WRPF accompany reductions in emotional eating in a general sample of young adults. This holds implications for possibly utilizing such an approach outside of groups specifically targeted for emotional eating and suggesting utility of ACT in reducing emotional eating

in the general population of overweight young adults.

Katterman and colleagues (2014) also discussed the role of dietary education in weight-management interventions. The authors stated that only a handful of interventions demonstrated weight changes when dietary education was provided in conjunction with mindfulness. While the ACT intervention utilized in this study was more comprehensive than simply providing mindfulness skills, it did not actively provide dietary education. Participants were encouraged to utilize the psychoeducational packet, which included basic dietary education, though no checks were made to evaluate the level of utilization of the information provided. This may be another area where the current study supported existing literature, as there is only tenuous support for the utility of the experimental intervention to produce significant weight loss from initial assessment to follow-up.

The intervention also did not appear to have significant influence on some targeted study variables, especially the impact of weight on quality of life. While change scores in AAQW correlated with changes in emotional eating and uncontrolled eating, no correlation was observed between improvements in WRPF and improvements in physical activity, weight loss, or cognitive restraint. The non-significant ANOVA findings for weight-related quality of life and eating process variables may argue that the intervention effectively addressed the proposed mechanism of action, but that this did not translate to meaningful change in outcomes. This conclusion differs from previous findings that changes in WRPF can, in fact, predict improvements in obesity outcomes (Niemeier et al., 2012) and specifically quality of life (Lillis et al., 2009). Lillis and colelagues found that an ACT workshop produced meaningful improvements in quality of life that were

observed irrespective of weight loss. In the current study, however, no significant changes in quality of life were observed in participants who underwent the experimental intervention. This may be because of the weak relationship between weight and impact of weight on quality of life that was observed in this study. If individuals are reporting that weight itself is not related to their perceived impact of weight on quality of life, an intervention focused on reducing weight and improving WRPF may be unlikely to show improvement in quality of life, as it is not directly related to the primary psychological target of the intervention.

However, there may also be limitations in the extent to which "improvements" in psychological flexibility map onto "improvements" in eating process as measured in the TFEQ-18 subscales. For example, the CR subscale included items such as "How likely are you to consciously eat less than you want?" A more "cognitively restrained" answer (i.e., higher in the CR subscale) would be to indicate that an individual is *very likely* to deliberately eat less than he/she wants. From an ACT perspective, this question can be seen in multiple lights. One may view this question as asking, "Based on my values, if I set a goal as to how much I would like to eat, to what extent do I effortfully and deliberately follow that stated intention (i.e., values-consistent action)?" However, it could also be interpreted as "To what extent to I *buy into* negative self-talk about how much I *should* be eating (i.e., cognitive fusion)?"

In the first case above (i.e., values-consistent action), a more psychologically flexible answer may be to indicate a high likelihood of deliberately eating less than he/she wants. In contrast, if an individual interprets this item in the latter sense (i.e., "I

buy into thoughts about how much I should eat"), a more psychologically flexible, improved answer may be to rate this as less likely. From a theoretical perspective, this may cause problems in interpreting CR scores and AAQW scores both as targets of an intervention promoting WRPF. It may be the case that improvements in CR scores simply fail to map cleanly onto improvements in WRPF due to nebulous interpretation of the items within the CR scale. It appears unlikely that a similar problem exists within the other to subscales (emotional eating and uncontrolled eating) as those items more closely mirror those predicted by improvements in psychological flexibility (e.g., "When I feel lonely, I console myself by eating," "When I feel blue, I often overeat," "Sometimes when I start eating, I just can't seem to stop").

Another possible conclusion for the non-significant change in health behaviors may be that participants failed to firmly clarify or establish values in regards to this domain. Forman and Butryn (2015) stated that clarified health values are essential to effecting meaningful change in obesity intervention. The authors contended that environmental stressors, personal habits, and a myriad of other personal and contextual factors make behavior change difficult. Physical activity is uncomfortable, eating new foods can be inconvenient, self-monitoring is cumbersome. However, if a person can attach those challenging behaviors to values, they can in turn become reinforcing (Deci & Ryan, 2000).

In this ACT intervention, experimental participants were encouraged to explore and state their values about health, which often included being more physically active and eating more healthily (in addition to changes such as being more accepting of one's body,

being more compassionate about difficult changes, and others). In this way, it was hypothesized that participants would be able to internally attach difficult behavior changes to their stated value and thus make that behavior more reinforcing, increasing their likelihood of engaging in previously avoided physical activity. In fact, many participants made such statements in groups (e.g., expressing desire to be more active, describing a more valued life including more physical activity). However, no formal assessment was conducted to determine if, in fact, participants *did* internalize such a value that included physical activity. In other words, if participants did not firmly establish a value that included being more active, engaging in more valued living may not necessarily include being more physically active. Without a clear assessment of this, the current study cannot conclude that participants effectively connected physical activity to a valued direction. Clarified values are one portion of the AAQW, though a more nuanced assessment of the extent to which health-related values were clearly identified and internalized would have be useful in determining treatment efficacy.

It was predicted that those individuals who were more overweight would experience more impact of weight on quality of life (i.e., higher IWQOL scores) and would have a greater level of weight-related psychological inflexibility (i.e., higher AAQW scores). What bore out in the data, however, was that only Public Distress moderately correlated with individuals' BMI. Those individuals with higher BMI reported that they experienced a greater amount of public discomfort (e.g., difficulty with ridicule/teasing, instrumental difficulties like fitting through turnstiles or finding comfortable chairs, or experiencing discrimination because of weight). Importantly,

AAQW scores did not significantly correlate with BMI.

There are many possible explanations of the higher levels of public distress among more overweight individuals. It is possible that those individuals who are more overweight are bumping up against artifacts of culture that adversely impact overweight or obese individuals (e.g., cultural idealization of thinness and ridicule or obesity, disregard for the comfort of overweight/obese individuals in furniture design, perception of overweight individuals as just targets of ridicule). Puhl and Heuer (2009) discussed the stigma associated with obesity, including the widespread cultural perception that obese individuals are lazy, incompetent, sloppy, undisciplined, unmotivated, and deserving of mistreatment. Puhl and Heuer concluded that the widespread stereotypes about obese individuals contribute to their mistreatment, including "social injustice, unfair treatment, and impaired quality of life as a result of substantial disadvantages and stigma" (p. 941).

It may also be the case that the positive relationship between weight and public distress, while other areas of quality of life were unrelated, supports the conclusion that obesity is incongruent with many of the functional aspects of public life. For example, three of the five items within the public distress subscale of the IWQOL speak to physical limitations of instrumental elements of functional public living (i.e., finding chairs in public which are comfortable, finding chairs which reliably support one's weight, and fitting through aisles and turnstiles). It may be that these instrumental design choices, made by public companies and other public institutions, are made with a normative expectation of thinness and disregard for the needs and comfort of overweight individuals. In other words, design may be conducted under the assumption that most

people will not need accommodation for overweight/obesity, because these conditions may be viewed as outside of the population norm. However, overweight and obesity are actually *normative* within the population (i.e., greater than 60% by most estimates). As such, overweight and obese people may frequently encounter such evidence of their needs and comfort being disregarded, evidencing the assertion of Puhl and Heuer (2009) of obese people as fair targets of ridicule and stigma.

The results from this study may also support the contention of Bacon and Aphramor (2011) and others that focusing on weight specifically to improve quality of life of overweight and obese individuals may likely be oversimplifying a complex issue. Bacon and Aphramor supported the contention that promulgating the notion that changes in weight will equate to changes in quality of life or improved health is misleading and unhelpful. Rather, the authors argue that weight interventions should focus on health promotion and "modifiable behaviors where there is evidence that such modification will improve health. Weight is not a behavior and therefore is not an appropriate target for behavior modification" (Bacon & Aphramor, 2011, p. 9).

In this regard, the experimental intervention in this investigation was highly targeted toward lifestyle behaviors, rather than weight itself. Much of the discussion within the context of the groups was about what an individual *may gain* by living a life more focused on healthfulness rather than what a person *must lose* in order to find improvement in quality of life. In this vein, the groups reflected that weight itself was a poor predictor of quality of life and may not be the most meaningful outcome of study in the service of quality of life improvement. Nevertheless, further research is needed in

order to clarify this question.

Limitations

The results of the current investigation have potentially important implications for better understanding of brief interventions for overweight and obesity. However, there are important limitations that must be carefully considered in interpreting the results. One central limitation of this study is the small sample size. Wilson VanVoorhis and Morgan (2007) recommended the oft-cited guideline of 30 participants per cell when conducting factorial ANOVA, with no fewer than seven participants per cell, to achieve adequate statistical power. While the current study utilized a repeated-measures factor in order to improve statistical power, the cell sizes (19 and 17) were still relatively small and thus limited statistical significance as well as generalizability. Several interaction terms would have likely been statistically significant with just a few additional participants per cell.

The sample in this study also had limitations due to both its heterogeneity across some variables (e.g., weight) and homogeneity in others (e.g., age, education, ethnicity). The range of BMI in which participants were required to fall to be eligible to participate was drawn from previous research (Niemeier et al., 2012) with the intent to include as many individuals as possible to both improve ability to generalize findings and maximize recruitment potential. However, it may be the case that there are different levels of functional challenges faced by individuals with a BMI of 27 versus a BMI of 45. To illustrate, a person whose height is 65 inches (5 feet 5 inches) with a BMI of 27 weighs 162 pounds, while a person of equivalent height with a BMI of 45 weighs 271 pounds.

These two hypothetical individuals may likely face greatly differing challenges in implementation of various aspects of the current intervention, such as engaging in physical activity, disengaging from thoughts about how others may perceive them, and unhooking from self-critical or unhelpful criticisms about their physical appearance. The current study did not have sufficient sample size to make comparisons of efficacy across the spectrum of obtained BMI measurements, but this would lend important information for future intervention with overweight and obese individuals.

In addition to possible difficulties implementing strategies covered in the treatment group, it may have been challenging for individuals with such widely varying BMIs to relate to one another in a group-based intervention (i.e., experimental group members had BMIs that ranged from 27.05 to 44.65). It is commonly held that therapeutic benefits in group intervention stem largely from group cohesion, learning from experiences of other group members, universality and normalizing of common experiences, and imitative behavior (Yalom & Leszcz, 2008). This may have been limited in the current study with individuals who were moderately overweight sharing and relating experiences with individuals who were severely obese. In other words, there may have been some limited ability to connect with and feel validated by the experiences of other group members whose weights were dramatically different.

While the sample had limitations with regard to heterogeneity of weight, other demographic variables had relatively little variance. One clear example is in age. The current study was conceived as a feasibility study, meant to evaluate a novel intervention within a relatively homogeneous sample of broadly healthy, low-risk participants. To do

this, exclusion criteria were put into place which restricted individuals with potentially severe mental health concerns (e.g., active mania, major depressive episode, psychosis, or substance use disorders). Inclusion criteria were established to limit the age of participants in order to partially reduce the risk of problematic comorbid health problems which often develop in overweight and obese individuals in later life (e.g., orthopedic problems, cardiovascular disease, metabolic syndrome). By restricting the sample to young adults, however, the current study may have limited the impact of the intervention. For example, some ACT-based interventions rely on (or at least presume) a history of suffering as a result of unsuccessful attempts to manage, regulate, or avoid internal experiences. A central tent of ACT is the prioritization of experiential evidence over cognitive evidence (Hayes et al., 2012, p. 190). However, if an individual does not have (or does not perceive she/he has) a significant history of experiences that support the unworkability of their avoidance strategies, ACT-based interventions may be less effective, as they may not powerfully resonate. In specifically targeting young adults who, in many cases, only recently developed problems with weight, the current study may not have been the best fit for their particular struggles. It was certainly evident in many cases that participants had long histories of ineffective strategies of control and avoidance of weight-related thoughts and emotions. Nevertheless, the young age of the sample may have served as a limitation to the intervention's efficacy.

In order to potentially work around the issue of "limited suffering history," it may be beneficial to explore the utility of this protocol in a sample of individuals with a history of failed attempts to manage weight on their own or who had found other

strategies ineffective. In the current sample, only 30.6% of participants reported previous *bona fide* weight loss attempts prior to the current study. In the general population of obese adults, 50-70% are actively trying to lose weight (Nicklas, Huskey, Davis, & Wee, 2012). Therefore, because the tenets of this intervention presume unsuccessful previous weight loss efforts, it may be recommended that this group intervention be used subsequent to other weight loss efforts should they prove ineffective.

Another limitation of the sample was the relative homogeneity of ethnicity. The vast majority of participants in both conditions self-identified as White. While this is broadly reflective of the demography of the area from which the sample is drawn, it limits the ability to generalize findings. No specific efforts were undertaken during recruitment to diversify the sample in terms of ethnicity. Future research may improve generalizability of findings by deliberately recruiting a more ethnically diverse sample. Similar limitations apply to other demographic variables, such as education (most participants had at least some college education) and biological sex (most participants were women).

One significant limitation was the high level of missing data in self-reported dietary intake, such that the data were not appropriate to be analyzed beyond description. The methods of measurement of dietary intake (ASA24) were chosen in order to balance the convenience of participants, time constraints on study personnel, and quality of data collected. In doing so, the method decided upon still may have placed a burden on participants to complete measures frequently and outside of the presence of study personnel. To improve likelihood of data completion, participants were called, emailed,

and sent text messages frequently throughout data collection periods. Nevertheless, very few participants completed all three entries in the ASA24 and daily physical activity measurements for the entire week of measurement before and after intervention/control conditions. It may be the case that the ASA24, while widely used in research, continues to represent a barrier for completion of self-reported dietary intake. Beechy and colleagues (2012) clearly asserted that all measures of dietary intake have strengths and limitations, but that the multi-pass, three-day measurement methodology employed in this study is one of the preferred strategies for gathering dietary intake data. However, Beechy and colleagues also pointed out that self-report measures of dietary intake often accompany underreporting and difficulty with participant burden. In this study, no formal data were collected regarding amount of time necessary to complete ASA24 entries. Some participants did report that they were spending in excess of 30 minutes per entry and encountering glitches and crashes in the software that frustrated them and caused them to stop completing entries. Clearly, this limited the utility of the dietary intake data and may have presented more burden that usefulness.

With regard to physical activity, the data were again limited, though to a lesser extent. Participants were asked to simply record daily the number of minutes they spent completing physical activity for the purpose of exercise. It may be the case that participants did not remember to complete these entries without daily prompting. Instead, participants were contacted after their 1-week data collection period and asked to report the data to study personnel.

It is very important that future studies attempting to include diet and physical

activity data include more effective data collection strategies. Beechy and colleagues (2012) acknowledged that the various methods of measurement for physical activity and diet have limitations. For example, they stated that some standardized self-report questionnaires overestimate physical activity and underestimate food intake. The authors recommend using wearable devices, such as accelerometers, skin surface electrodes, or video cameras to improve accuracy. Other ideas may include having participants photograph and send photos to study personnel in order to reduce participant time burden, mobile applications for cellular phones, and personal data assistant devices that participants carry with them. However, many of these technologies have not yet been tested in research. At the least, participants in this study may have improved their completion of physical activity data if they had been prompted to report their minutes daily in lieu of waiting until the end of the week to present it at once, as they may have forgotten by the time they were prompted. It may also be helpful to develop a more substantial and/or more sophisticated incentive system to improve completion of daily food records.

In addition to problems with missing data in the nutrition and physical activity data, no data were collected about the intensity of activity in which participants engaged. In simply measuring the amount of minutes spent doing physical activity for exercise, no conclusions could be drawn regarding the amount of energy actually expended from this activity. This represents a significant limitation in predicting weight change from behavior change. For example, if one participant reported engaging in 90 minutes of walking for exercise prior to intervention, and 90 minutes of jogging after intervention,

no change would be detected despite a dramatic increase in the estimated number of calories burned in the respective physical activity reported. It would be important for future research to consider a more detailed level of specificity (e.g., subjective intensity measurements, formal questionnaires, pedometers, etc.) to improve the quality of physical activity data and better detect meaningful changes.

The intervention itself serves as another important limitation to address. Several elements of the experimental intervention may be modified in future research in order to produce better outcomes. One useful modification may be to reduce the overall amount of material covered in the intervention. Across study cohorts, group facilitators had difficulty including all aspects of each session. This led to a more didactic experience than is ideal for ACT. The more didactic focus of the groups was reflected as a weakness in session coding for treatment integrity. Another possible limitation of the group was the diversity of the sample. In an effort to maximize inclusion in the study, participants varied widely in their pre-intervention screening variables (e.g., BMI, emotional eating, past dieting experiences, to name a few). With such a large degree of intra-group diversity, it may have limited the impact of group cohesion and ability of participants to relate to the struggles of one another. It may be more effective to specifically target individuals with high levels of emotional eating or uncontrolled eating, for example, as changes in these domains were more positively associated with changes in the group's focus. It may also be helpful for future implementations of this intervention to recruit samples with more similar BMI such that aspects such as physical limitations, public distress, and weight stigma may be more similar across participants.

Summary and Implications for Future Research

While the results of this study must be interpreted cautiously, the current investigation does appear to support the utility of brief acceptance-based behavioral intervention to intervene with overweight and obese young adults. Clearly, the results and interpretations described above function as pilot data for a burgeoning use of an intervention technology which has been effective in many other aspects of behavioral medicine (Dahl, Wilson, & Nilsson, 2004; Hayes et al., 2004; Twohig, Schoenberger, & Hayes, 2007).

At the outset of this investigation, it was hypothesized that experiential avoidance, particularly related to self-critical and punishing cognitions and emotions regarding weight, played an important role in the development and maintenance of overweight and obesity. Specifically, it was hypothesized that overweight and obese individuals who were highly fused to their painful weight-related inner experiences would be reluctant to engage in physical activity and would utilize unhealthful eating behavior as a strategy of avoidance. In doing so, highly avoidant overweight and obese individuals would be likely to report eating in response to emotions, feeling out of control of their eating, report weight adversely impacting their lives, and would report little physical activity. With the totality of these interrelated and overwhelming cognitive and behavioral patterns, making behavioral change seems overwhelming and therefore weight would continue to increase while psychological rigidity and avoidance would continue to become increasingly ingrained. As such, the experimental intervention was designed to target the hypothesized linchpin of this complex conglomerate of cognition, behavior, and affect: psychological

flexibility.

Niemeier and colleagues (2012) hypothesized that an ACT-based intervention for overweight and obesity provided individuals with strategies to anticipate "internal antecedents for eating and exercise behaviors" (p. 428). Specifically, by teaching overweight and obese individuals to more effectively contact the present moment and unhook from automatic and reflexive cognitions, participants would be better able to recognize their own patterns of eating and avoiding exercise in response to emotion. However, it was necessary to provide evidence that an ACT-based intervention could effectively intervene upon not only psychological flexibility, but the process-level eating behaviors.

The current study tentatively showed that a brief ACT-based intervention can effectively reduce the level of emotional eating and uncontrolled eating of overweight and obese young adults, while an information control condition did not. While the ANOVA level analysis did not yield significant interaction effects for these questions, with increased sample size, such a differential effect is likely to be fleshed out. Importantly, increases in WRPF, the theoretically predicted mechanism of action, also correlated with predicted improvements in both uncontrolled eating and emotional eating. At the level of eating process, it appears that the intervention yielded promising results. Similar results were obtained from examination of the eating content, with improvements in psychological flexibility correlating with increased protein consumption, decreased saturated fat, and decreased total fat consumption.

While the current results are promising, further research with an adequate sample

size is a next logical step. The findings from this investigation should be considered preliminary given the significant lack of statistical power and issues with missing data in dietary intake and physical activity. It would be prudent to improve upon some of the assessment methodology and collect replication data to solidify the findings from this study.

One area clearly left for further study is adapting the intervention to better intervene on physical activity. Given the mechanics of weight loss (i.e., caloric intake and caloric utilization), an effective intervention in addressing obesity can maximally impact weight when it can address both contributors. In the current study, the experimental intervention did not effectively increase physical activity, despite physical activity avoidance being heavily represented in the content of the intervention itself. This may also be adversely impacted by ineffective measurement of physical activity. Future research could improve in both the measurement of physical activity (e.g., more nuanced, less reliance on self-report) and more effective targeting of physical activity in session content. For example, it may be useful to provide some in-session walking mindfulness practice in lieu of a homework assignment.

In addition to changes with respect to physical activity, further investigation with this protocol would benefit from reducing the amount of content in each session, particularly Session Two. In all five groups that completed the protocol, Session Two presented significant difficulty to group facilitators because of the amount of content included. Given the experiential focus in ACT, it would be helpful in further investigation to reduce the amount of didactic instruction throughout the protocol and

include more focus on experiential learning.

Finally, while not an explicit focus of the current study, it may be beneficial to provide more thorough psychoeducational materials to participants and also gather data regarding its utilization. The current investigation did not prioritize psychoeducation as the primary means of achieving change, and in fact this was borne out as psychoeducation alone did not produce significant change in any of the primary study variables. However, it is unclear the extent to which experimental participants benefitted from the psychoeducational materials regarding nutrition, habits, and physical activity recommendations as no data were collected about if the materials were utilized. It may be the case that experimental participants were more apt to utilize the educational materials and the materials may have been effective and an important aspect of the intervention. However, as no data were collected about this, no such conclusions can be drawn.

Acceptance-based behavioral interventions are under a great deal of investigation in their utility to treat a broad range of health problems. ACT in particular has been shown to be effective in treating a broad range of health issues, including obesity (Niemeier et al., 2012; Forman et al., 2009; Lillis & Hayes, 2008). Prior to the current investigation, however, no studies had clearly evaluated a brief, targeted ACT intervention compared to a psychoeducation control group in a general sample of overweight young adults. In addition, this study was unique in its demonstration of important correlations in ACT process changes and changes to eating process in young adults. Future research can further explore the efficacy of brief acceptance-based behavioral intervention with overweight and obese adults with larger, more nuanced RCT

design, and comparing acceptance-based intervention with other control conditions. This research does not directly challenge sociocultural etiological factors which may relate to the rising tide of obesity among young adults. Nevertheless, ACT may represent an effective tool to help mitigate the complex constellation of influences to help clarify their health-related values, develop insight into their own cognitions, and choose lifestyle behaviors consistent with their stated values. The results from the current investigation represent promising support for emerging literature regarding the utility of ACT to improve the health of overweight and obese adults.

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APPENDICES

Appendix A

Tables Showing Comparisons of Included Participants and Excluded Individuals

Table A1

Continuous Variables (Independent-Samples t *Tests)*

Variable	M_{INC}	M_{EXC}	*df*	*t*	*p*	*d*
Age	22.81	21.29	41	1.307	0.199	0.408
Weight	208.86	208.97	41	-0.006	0.959	0.002
Physical Activity	94.39	107.5	30	-0.226	0.823	0.083
TFEQ - Cog. Rest.	45.83	34.92	41	1.289	0.205	0.403
TFEQ - Unc. Eat.	57.75	63.10	41	-1.523	0.143	0.476
TFEQ - Em. Eat.	65.71	79.37	40	-1.363	0.181	0.431
IWQOL - PF	21.33	23.43	41	-0.932	0.357	0.291
IWQOL - SE	25.50	23.71	41	0.876	0.386	0.274
IWQOL - SL	8.18	8.29	38	-0.072	0.943	0.022
IWQOL - PD	8.42	8.86	41	-0.299	0.766	0.093
IWQOL - WO	7.42	7.43	41	-0.011	0.992	0.003
IWQOL - Total	71.03	71.71	41	-0.133	0.895	0.042
AAQW - Total	91.56	92.57	41	-0.168	0.884	0.052

Note. Cog Rest. = Cognitive Restraint; Unc. Eat. = Uncontrolled Eating; Em. Eat. = Emotional Eating; PF = Physical Functioning; SE = Self-Esteem; SL = Sexual Life; PD = Public Distress; WO = Work.

Table A2

Nominal Variables (χ^2)

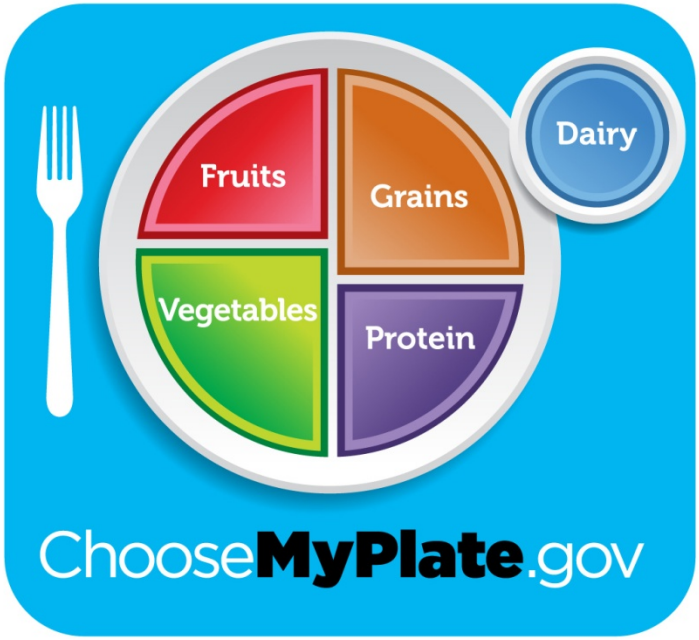
Variable	*N*	*df*	χ^2	*p*	*Φ*
Education	43	3	2.239	0.505	0.233
Relationship Status	43	3	5.444	0.142	0.356
Children (yes/no)	43	1	0.024	0.876	-0.024
Ethnicity	43	4	1.111	0.893	0.161
Prior Weight Loss (yes/no)	43	1	1.824	0.177	0.206

Appendix B

Psychoeducational Materials

Healthy Eating for a Healthy Weight

A healthy lifestyle involves many choices. Among them, choosing a balanced diet or healthy eating plan. So how do you choose a healthy eating plan? Let's begin by defining what a healthy eating plan is.



According to the *Dietary Guidelines for Americans* 2010, a healthy eating plan:

- Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products
- Includes lean meats, poultry, fish, beans, eggs, and nuts
- Is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars
- Stays within your daily calorie needs

Eat Healthfully and Enjoy It!

A healthy eating plan that helps you manage your weight includes a variety of foods you may not have considered. If "healthy eating" makes you think about the foods you **can't** have, try refocusing on all the new foods you **can** eat—

- **Fresh fruits** — don't think just apples or bananas. All fresh fruits are great choices. Be sure to try some "exotic" fruits, too. How about a mango? Or a juicy pineapple or kiwi fruit! When your favorite fresh fruits aren't in season, try a frozen, canned, or dried variety of a fresh fruit you enjoy. One caution about canned fruits is that they may contain added sugars or syrups. Be sure and choose canned varieties of fruit packed in water or in their own juice.
- **Fresh vegetables** — try something new. You may find that you love grilled

vegetables or steamed vegetables with an herb you haven't tried like rosemary. You can sauté vegetables in a non-stick pan with a small amount of cooking spray. Or try frozen or canned vegetables for a quick side dish — just microwave and serve. When trying canned vegetables, look for vegetables without added salt, butter, or cream sauces. Commit to going to the produce department and trying a new vegetable each week.

- **Calcium-rich foods** — you may automatically think of a glass of low-fat or fat-free milk when someone says "eat more dairy products." But what about low-fat and fat-free yogurts without added sugars? These come in a wide variety of flavors and can be a great dessert substitute for those with a sweet tooth.
- **A new twist on an old favorite** — if your favorite recipe calls for frying fish or breaded chicken, try healthier variations using baking or grilling. Maybe even try a recipe that uses dry beans in place of higher-fat meats. Ask around or search the internet and magazines for recipes with fewer calories — you might be surprised to find you have a new favorite dish!

Do I have to give up my favorite comfort food?

No! Healthy eating is all about balance. You can enjoy your favorite foods even if they are high in calories, fat or added sugars. The key is eating them only once in a while and balance them out with healthier foods and more physical activity.

Some general tips for comfort foods:

- Consume them less often. If you normally eat these foods every day, cut back to once a week or once a month. You'll be cutting your calories because you're not having the food as often.
- Eat smaller amounts. If your favorite higher calorie food is a chocolate bar, have a smaller size or only half a bar. Be careful! This technique works well for some people, but others may find it is too tempting to have their favorite food available, even in smaller amounts.
- Try a lower-calorie version. Use lower-calorie ingredients or prepare it differently. For example, if your macaroni and cheese recipe uses whole milk, butter, and full-fat cheese, try remaking it with non-fat milk, less butter, light cream cheese, fresh spinach and tomatoes. Just remember to not increase your portion size.

Improving Your Eating Habits

When it comes to eating, we have strong habits. Some are good ("I always eat breakfast"), and some are not so good ("I always clean my plate"). Although many of our eating habits were established during childhood, it doesn't mean it's too late to change them.

Making sudden, radical changes to eating habits such as eating nothing but cabbage soup, can lead to short term weight loss. However, such radical changes are neither healthy nor a good idea, and won't be successful in the long run. Permanently improving your eating habits requires a thoughtful approach in which you Reflect, Replace, and Reinforce.

- **REFLECT** on all of your specific eating habits, both bad and good; and, your common triggers for unhealthy eating.
- **REPLACE** your unhealthy eating habits with healthier ones.
- **REINFORCE** your new, healthier eating habits.

Reflect, Replace, Reinforce: A process for improving your eating habits

1. **Create a list of your eating habits.** Keeping a food diary for a few days, in which you write down everything you eat and the time of day you ate it, will help you uncover your habits. For example, you might discover that you always seek a sweet snack to get you through the mid-afternoon energy slump. Use a diary to help. It's good to note how you were feeling when you decided to eat, especially if you were eating when not hungry. Were you tired? Stressed out?

2. **Highlight the habits** on your list that may be leading you to overeat. Common eating habits that can lead to weight gain are:

   - Eating too fast
   - Always cleaning your plate
   - Eating when not hungry
   - Eating while standing up (may lead to eating mindlessly or too quickly)
   - Always eating dessert
   - Skipping meals (or maybe just breakfast)

3. **Look at the unhealthy eating habits** you've highlighted. Be sure you've identified all the triggers that cause you to engage in those habits. Identify a few you'd like to work on improving first. Don't forget to pat yourself on the back for the things you're doing right. Maybe you almost always eat fruit for dessert, or you drink low-fat or fat-free milk. These are good habits! Recognizing your successes will help encourage you to make more changes.

4. **Create a list of "cues"** by reviewing your food diary to become more aware of when and where you're "triggered" to eat for reasons other than hunger. Note how you are typically feeling at those times. Often an environmental "cue", or a particular emotional state, is what encourages eating for non-hunger reasons.

   Common triggers for eating when not hungry are:

   - Opening up the cabinet and seeing your favorite snack food.
   - Sitting at home watching television.
   - Before or after a stressful meeting or situation at work.
   - Coming home after work and having no idea what's for dinner.
   - Having someone offer you a dish they made "just for you!"
   - Walking past a candy dish on the counter.
   - Sitting in the break room beside the vending machine.
   - Seeing a plate of doughnuts at the morning staff meeting.
   - Swinging through your favorite drive-through every morning.
   - Feeling bored or tired and thinking food might offer a pick-me-up.

5. **Circle the "cues" on your list that you face on a daily or weekly basis**. Going home for the Thanksgiving holiday may be a trigger for you to overeat, and eventually, you want to have a plan for as many eating cues as you can. But for now, focus on the ones you face more often.

6. **Ask yourself** these questions for each "cue" you've circled:

   - **Is there anything I can do to avoid the cue or situation?** This option works best for cues that don't involve others. For example, could you choose a different route to work to avoid stopping at a fast food restaurant on the way? Is there another place in the break room where you can sit so you're not next to the vending machine?

   - **For things I can't avoid, can I do something differently that would be healthier?**Obviously, you can't avoid all situations that trigger your unhealthy eating habits, like staff meetings at work. In these situations, evaluate your options. Could you suggest or bring healthier snacks or beverages? Could you offer to take notes to distract your attention? Could you sit farther away from the food so it won't be as easy to grab something? Could you plan ahead and eat a healthy snack before the meeting?

7. **Replace unhealthy habits with new, healthy ones**. For example, in reflecting upon your eating habits, you may realize that you eat too fast when you eat alone. So, make a commitment to share a lunch each week with a colleague, or have a neighbor over for dinner one night a week. Other strategies might include putting your fork down between bites or minimizing other distractions (i.e., watching the news during dinner) that might keep you from paying attention to how quickly — and how much — you're eating.
   Here are more ideas to help you replace unhealthy habits:

   - Eat more slowly. If you eat too quickly, you may "clean your plate" instead of paying attention to whether your hunger is satisfied.

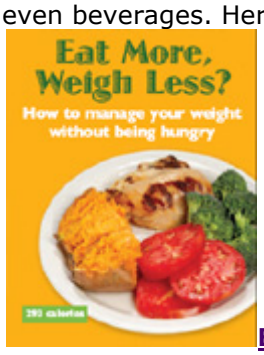
   - Eat only when you're truly hungry instead of when you are tired, anxious, or feeling an emotion besides hunger. If you find yourself eating when you are experiencing an emotion besides hunger, such as boredom or anxiety, try to find a non-eating activity to do instead. You may find a quick walk or phone call with a friend helps you feel better.

   - Plan meals ahead of time to ensure that you eat a healthy well-balanced meal.

8. **Reinforce your new, healthy habits and be patient with yourself**. Habits take time to develop. It doesn't happen overnight. When you do find yourself engaging in an unhealthy habit, stop as quickly as possible and ask yourself: Why do I do this? When did I start doing this? What changes do I need to make? Be careful not to berate yourself or think that one mistake "blows" a whole day's worth of healthy habits. You can do it! It just takes one day at a time!

Cutting Calories

Once you start looking, you can find ways to cut calories for your meals, snacks, and even beverages. Here are some examples to get you started.



Eat More, Weigh Less?

Eating fewer calories doesn't necessarily mean eating less food. To be able to cut calories without eating less and feeling hungry, you need to replace some higher calorie foods with foods that are lower in calories *and* fill you up. In general, these foods contain a lot of water and are high in fiber.

Rethink Your Drink

Most people try to reduce their calorie intake by focusing on food, but another way to cut calories may be to change what you drink. You may find that you're consuming quite a few calories just in the beverages you have each day. Visit Rethink Your Drink for more information about the calories in beverages and how you can make better drink choices to reduce your calorie intake.

How to Avoid Portion Size Pitfalls to Help Manage Your Weight

You may find that your portion sizes are leading you to eat more calories than you realize. Research shows that people unintentionally consume more calories when faced with larger portions. This can mean excessive calorie intake, especially when eating high-calorie foods.

How to Use Fruits and Vegetables to Help Manage Your Weight

Learn about fruits and vegetables and their role in your weight management plan. Tips to cut calories by substituting fruits and vegetables are included with meal-by-meal

examples. You will also find snack ideas that are 100 calories or less. With these helpful tips, you will soon be on your way to adding more fruits and vegetables into your healthy eating plan.

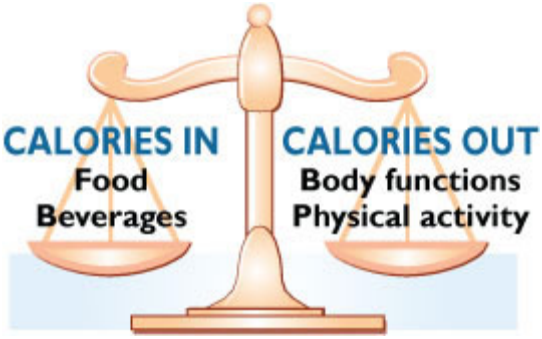
Ideas for Every Meal[1]

Breakfast	**Substitution**	**Calories Reduced by**
Top your cereal with low fat or fat-free milk instead of 2% or whole milk.	1 cup of fat-free milk instead of 1 cup of whole milk	63
Use a non-stick pan and cooking spray (rather than butter) to scramble or fry eggs	1 spray of cooking spray instead of 1 pat of butter	34
Choose reduced-calorie margarine spread for toast rather than butter or stick margarine.	2 pats of reduced calorie margarine instead of 2 pats of butter	36
Lunch	**Substitution**	**Calories Reduced by**
Add more vegetables such as cucumbers, lettuce, tomato, and onions to a sandwich instead of extra meat or cheese.	2 slices of tomatoes, ¼ cup of sliced cucumbers, and 2 slices of onions instead of an extra slice (3/4 ounce) of cheese and 2 slices (1 ounce) of ham	154
Accompany a sandwich with salad or fruit instead of chips or French fries.	½ cup diced raw pineapple instead of 1 ounce bag of potato chips	118
Choose vegetable-based broth soups rather than cream- or meat-based soups.	1 cup of vegetable soup instead of 1 cup cream of chicken soup	45
When eating a salad, dip your fork into dressing instead of pouring lots of dressing on the salad.	½ TBSP of regular ranch salad dressing instead of 2 TBSP of regular ranch dressing	109
When eating out, substitute a broth-based soup or a green lettuce salad for French fries or chips as a side dish	A side salad with a packet of low-fat vinaigrette dressing instead of a medium order of French fries	270

Dinner	Substitution	Calories Reduced by
Have steamed or grilled vegetables rather than those sautéed in butter or oil. Try lemon juice and herbs to flavor the vegetables. You can also sauté with non-stick cooking spray.	½ cup steamed broccoli instead of ½ cup broccoli sautéed in 1/2 TBSP of vegetable oil.	62
Modify recipes to reduce the amount of fat and calories. For example, when making lasagna, use part-skim ricotta cheese instead of whole-milk ricotta cheese. Substitute shredded vegetables, such as carrots, zucchini, and spinach for some of the ground meat in lasagna.	1 cup of part-skim ricotta cheese instead of 1 cup whole milk ricotta cheese	89
When eating out, have a cocktail or dessert instead of both during the same eating occasion.	Choosing one or the other saves you calories. A 12-ounce beer has about 153 calories. A slice of apple pie (1/6 of a 8” pie) has 277 calories.	153 if you have the apple pie without the drink 277 if you have a drink and no pie.
When having pizza, choose vegetables as toppings and just a light sprinkling of cheese instead of fatty meats.	One slice of a cheese pizza instead of one slice of a meat and cheese pizza	60
Snacks	**Substitution**	**Calories Reduced by**
Choose air-popped popcorn instead of oil-popped popcorn and dry-roasted instead of oil-roasted nuts.	3 cups of air-popped popcorn instead of 3 cups of oil-popped popcorn	73
Avoid the vending machine by packing your own healthful snacks to bring to work. For example, consider vegetable sticks, fresh fruit, low fat or nonfat yogurt without added sugars, or a	An eight-ounce container of no sugar added nonfat yogurt instead of a package of 6 peanut butter crackers	82

small handful of dry-roasted nuts.		
Choose sparkling water instead of sweetened drinks or alcoholic beverages.	A bottle of carbonated water instead of a 12-ounce can of soda with sugar	136
Instead of cookies or other sweet snacks, have some fruit for a snack.	One large orange instead of 3 chocolate sandwich cookies	54

Balancing Calories



There's a lot of talk about the different components of food. Whether you're consuming carbohydrates, fats, or proteins all of them contain calories. If your diet focus is on any one of these alone, you're missing the bigger picture.

When it comes to maintaining a healthy weight for a lifetime, the bottom line is – **calories count!** Weight management is all about balance—balancing the number of calories you consume with the number of calories your body uses or "burns off."

- A *calorie* is defined as a unit of energy supplied by food. A calorie is a calorie regardless of its source. Whether you're eating carbohydrates, fats, sugars, or proteins, all of them contain calories.
- *Caloric balance* is like a scale. To remain in balance and maintain your body weight, the calories consumed (from foods) must be balanced by the calories used (in normal body functions, daily activities, and exercise).

If you are...	Your caloric balance status is...
Maintaining your weight	"**in balance**." You are eating roughly the same number of calories that your body is using. Your weight will remain **stable**.
Gaining weight	"**in caloric excess**." You are eating more calories than your body is using. You will store these extra calories as fat and

	you'll **gain** weight.
Losing weight	"**in caloric deficit**." You are eating fewer calories than you are using. Your body is pulling from its fat storage cells for energy, so your weight is **decreasing**.

Am I in Caloric Balance?

If you are maintaining your current body weight, you are in caloric balance. If you need to gain weight or to lose weight, you'll need to tip the balance scale in one direction or another to achieve your goal.

If you need to tip the balance scale in the direction of losing weight, keep in mind that it takes approximately 3,500 calories below your calorie needs to lose a pound of body fat.[1] To lose about 1 to 2 pounds per week, you'll need to reduce your caloric intake by 500—1000 calories per day.[2]

To learn how many calories you are currently eating, begin writing down the foods you eat and the beverages you drink each day. By writing down what you eat and drink, you become more aware of everything you are putting in your mouth. Also, begin writing down the physical activity you do each day and the length of time you do it. Use a pencil and paper diary for food intake and exercise to help.

Want to try an interactive approach evaluate your food intake and physical activity? Go to the Food Tracker (https://www.supertracker.usda.gov). The site will give you a detailed assessment and analysis of your current eating and physical activity habits. Physical activities (both daily activities and exercise) help tip the balance scale by increasing the calories you expend each day.

Recommended Physical Activity Levels

- 2 hours and 30 minutes (150 minutes) of moderate-intensity aerobic activity (i.e., brisk walking) every week and muscle-strengthening activities on 2 or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).
- Increasing the intensity or the amount of time that you are physically active can have even greater health benefits and may be needed to control body weight.
- Encourage children and teenagers to be physically active for at least 60 minutes each day, or almost every day.

The bottom line is… each person's body is unique and may have different caloric needs. A healthy lifestyle requires balance, in the foods you eat, in the beverages you consume, in the way you carry out your daily activities, and in the amount of physical activity or exercise you include in your daily routine. While counting calories is not necessary, it may help you in the beginning to gain an awareness of your eating habits as you strive to achieve energy balance. The ultimate test of balance is whether or not you are gaining, maintaining, or losing weight.

Questions and Answers About Calories

Q: Are fat-free and low-fat foods low in calories?

A: Not always. Some fat-free and low-fat foods have extra sugars, which push the calorie amount right back up. The following list of foods and their reduced fat varieties will show you that just because a product is fat-free, it doesn't mean that it is "calorie-free." And, calories do count!

Always read the Nutrition Facts food label to find out the calorie content. Remember, this is the calorie content for **one serving** of the food item, so be sure and check the serving size. If you eat more than one serving, you'll be eating more calories than is listed on the food label. For more information about the Nutrition Facts food label, visit How to Understand and Use the Nutrition Facts Food Label (http://www.cfsan.fda.gov/~dms/foodlab.html).

Q: If I eat late at night, will these calories automatically turn into body fat?

A: The time of day isn't what affects how your body uses calories. It's the overall number of calories you eat and the calories you burn over the course of 24 hours that affects your weight.

Q: I've heard it is more important to worry about carbohydrates than calories. Is this true?

A: By focusing only on carbohydrates, you can still eat too many calories. Also, if you

drastically reduce the variety of foods in your diet, you could end up sacrificing vital nutrients and not be able to sustain the diet over time.

Q: Does it matter how many calories I eat as long as I'm maintaining an active lifestyle

A: While physical activity is a vital part of weight control, so is controlling the number of calories you eat. If you consume more calories than you use through normal daily activities and physical activity, you will still gain weight.

Q. What other factors contribute to overweight and obesity?

A: Besides diet and behavior, environment, and genetic factors may also have an effect in causing people to be overweight and obese.

Other Useful Tips

Here are some quick tips for eating healthy on a budget:

- Make a menu. Plan out a rough sketch of what meals you want before you shop. It doesn't have to be super rigid, but it helps to plan what produce you'll need, what you may want to skip, and what staples need to be replenished.

- Make BIG amounts of food whenever you cook, **regardless of how many people are going to eat**. How much is a burrito from Café Rio? How nutritious? Soups, pastas, and many salads make awesome leftovers and can be prepared for a fraction of the price of prepared meals. It takes about 10% more time to prepare enough food for 6 meals as it does for 2. Why not throw some in the freezer for lunches and quick dinners?

- Look for generics. Most generics have nearly identical ingredient lists and can be as much as 1/3 the price. How much are you willing to pay for name recognition?

- Get to know the bulk section. Staples like grains, beans, and other items can be purchased in the quantity you need and often at a lower price per pound.

- Look for produce that's in season. Try to avoid simply buying what you're used to. Many fruits and vegetables fluctuate greatly in price throughout the year.

- Frozen veggies are your friend. Many veggies are equally nutritious frozen as they are flash frozen at peak ripeness. They really reduce cooking prep time.

- Be creative with sauces. Plain yogurt can serve as a base for a million sauces. From creamy garlic dill (just add dried dill and garlic powder), spicy chili lime (a little sriracha and lime juice), or even add garam masala for a cool Indian dip. Also things like fat-free sour cream, hot sauce, and vinegar are all low (or no) calorie flavor enhancers that are generally low in sodium.

- Take risks with recipes. Buy a new vegetable and try something fun. Pick a grain you've never had and look up a traditional recipe. Cooking is so fun when you're not afraid of the outcome. What's the worst that can happen? You make something you don't want to eat again.

- Avoid prepared meals whenever you can. That Lean Cuisine may only have 400 calories, but it is neither filling nor nutritious. Check out the nutrition on those things before buying.

Useful Links

http://www.choosemyplate.gov

Great resource for all things about healthy eating! Lots of great recipe ideas, information about nutrition, helpful tips about getting others involved, tracking your progress, and much more! Sponsored by the U.S. Department of Agriculture (USDA), with up-to-date information and research!

http://www.cdc.gov/healthyweight/healthy_eating/

The source for most of the information in this packet. The CDC has a fantastic list of links and resources to make eating healthily much more manageable.

Recipe Sites

One of the most exciting aspects of making lifestyle changes is learning new recipes! We recommend focusing on sites that provide nutritional data on their recipes. You can't always guarantee that the data given are 100% accurate, but they will give an approximate idea of what to expect nutritionally. There are *tons* of sites out there, but a few that are worth checking out are:

http://www.cdc.gov/healthyweight/healthy_eating/recipes.html

http://www.eatingwell.com

http://www.cookinglight.com

Appendix C

Treatment Adherence and ACT Compliance

Process	Definitions	Therapist Behavior (examples)
Acceptance	"The active and aware embrace of private events that are occasioned by our history, without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm" (Luoma et al., 2007). "Actively embracing private events (thoughts, feelings, bodily sensations), while they are presently occurring, as ongoing private experiences" (Twohig & Hayes, 2008).	• Encourages sticking with difficult thoughts, feelings, memories, and/or bodily sensations^ • Engages client in exposure exercises* • Talks about doing things just to do them or doing things for the experience* • Encourages behaviors that are new or have not been done for a long time* • Reinforces client for saying "I would usually not talk about this" or the like* • Encourages the client to engage in any of the above outside the session • Encourages client to actively move toward painful thoughts, feelings, memories, and/or bodily sensations. • Uses *two scales* metaphor
Creative Hopelessness (coded as Acceptance)	Undermining ineffective change strategies and emphasizing the negative consequences of the strategies.^	• Asks the client for specific instances of efforts to control or change thoughts or feelings^ • Asks about workability of control attempts^ • Uses "control as the problem" techniques (e.g., *polygraph*^, *man in the hole*^, *chocolate cake*, *wedge of lemon*, *mind reading*). • Reminds the client of historical control attempts^ • Encourages the client to engage in any of the above outside the session
Defusion	"Seeing thoughts and feelings for what they are (i.e., a verbally entangeled process of minding) rather than what they advertise themselves to be (e.g., the world understood; structured reality)" (Hayes et al., 1999). "The process of creating nonliteral contexts in which language can be seen as an active, ongoing, relational process that is historical in nature and present in the current moment" (Luoma et al., 2007).	• Talks about mind as a separate thing (e.g., "There goes your mind again"*, "thank your mind for that"^) • Encourages "I am having the thought that…"(or functional equivalent)^ • States that thought/feeling does not lead to action^ • Undermines "right and wrong" languaging* • Comments flexibly on the functions of thoughts* • Replaces "but" with "and"^ • Reinforces client for confusion* • Laughs at things in session* • Encourages the client to engage in any of the above outside the session • *Magic wand* or *$100,000* questions • *Your mind is not your friend* or *bad cup* metaphor • *Milk, milk, milk* or *having a thought vs buying a thought* exercise

Self-as-Context	"A continuous and secure 'I' from which events are experienced, but that is also distinct from those events" (Luoma et al., 2007). "Seeing that observations are being made from a consistent locus: I/here/now—the "you" aware of the experiences, not the experiences themselves" (Twohig & Hayes, 2008). "The locus from which a person's experience unfolds" (Bach & Moran, 2008).	• Reinforces client's perspective-taking (e.g., expression of empathy for others)* • Discusses private events as ongoing processes that do not define client* • Says "you are the place/container/context"…^ • Uses *chessboard* metaphor^ • Uses *observer* exercise • Encourages the client to engage in any of the above outside the session
Being Present	"Ongoing, nonjudgmental contact with psychological and environmental events as they occur" (Luoma et al., 2007). "Consciously experiencing internal and external events as they are occurring, without attachment to evaluation or judgment" (Twohig & Hayes, 2008).	• Helps client focus on bodily sensations, thoughts, and/or feelings in present^ • Describes own (therapist's) sensory experience of present • Models flexibility related to what the current environment affords* • Notes small events that transpire, or features of the room, with appreciation.* • Makes process comments about client (e.g., body language, affect) • Encourages the client to engage in any of the above outside the session
Values	"Chosen actions that can never be obtained as an object, but can be instantiated moment by moment" (Luoma et al., 2007). "Areas of importance that we recognize and embrace as guides of our patterns of action" (Twohig & Hayes, 2008).	• Engages in activities because of their intrinsic value and the vitality they bring* • Asks for clarity about what client wants* • Links previous pain to present purposes* • Reminds client of stated values^ • Encourages the client to engage in any of the above outside the session

Committed Action	"The development of larger and larger patterns of effective action linked to chosen values" (Luoma et al., 2007). "Behaving in the service of chosen values" (Bach & Moran, 2008).	• Assigns homework linked to short-, medium-, and long-term behavior change goals. • Asks client to generate behavioral goals^ • Encourages client to follow through on behavioral goals^ • Reinforces completion of homework and keeping of commitments* • Reinforces spontaneous engagement in new behaviors * • Encourages behavioral generalization to new domains* • Encourages flexibility, responsibility, and empowerment related to actions* • Encourages the client to engage in any of the above outside the session

^adapted from ACT for OCD Adherence Manual (Twohig & Plumb, 2008)
*adapted from ACT Verbatim (Twohig & Hayes, 2008)

OVERALL COMPETENCE OF THERAPIST: This item is intended to measure how skillfully the therapist delivered the treatment. The whole session should be considered when assigning a score to this item. How well the therapist attended to the client's needs and how well the therapist delivered the treatment outlined in the manual should be considered for this item. *****

A rating of:	*Would indicate:*
1 = not at all:	The therapist did not competently address any of the client's needs, did not attend to the client's responses to treatment targets, and did not apply any of the processes outlined in the manual.
2 = a little	The therapist addressed the client's needs only superficially, and/or attempted to apply the processes outlined in the manual but did so poorly.
3 = somewhat	The therapist sometimes addressed the client's needs, sometimes attended to the client's response to treatment targets, and applied the processes outlined in the manual only superficially.
4 = considerably	The therapist moderately addressed the client's needs, moderately attended to the client's response to treatment targets, and applied the processes outlined in the manual clearly and moderately in-depth.
5 = extensively	The therapist consistently addressed the client's needs, consistently attended to the client's response to treatment targets, and applied the processes outlined in the manual very clearly and in-depth.

*(from Plumb, J. C. & Vilardaga, R. (2010). Assessing treatment integrity in Acceptance and Commitment Therapy: Strategies and suggestions. *International Journal of Behavioral Consultation and Therapy, 6*, 263-295)

Appendix D

Study Measures

Demographic Questionnaire

1) What is your biological sex?
   _____ Male
   _____ Female

2) What is your current age in years? _____

3) What is the highest level of education you have completed?
   ____ Some high school
   ____ Graduated high school/GED
   ____ Some college (Did not graduate/Not yet graduated)
   ____ Completed 2yr degree (Associates)
   ____ Completed 4yr degree (BA/BS)
   ____ Master's degree
   ____ Doctoral/Professional degree (PhD, MD, JD)

4) What is your current relationship status?
   ____ Single, Never married
   ____ Married / Domestic partnership
   ____ Separated
   ____ Dating / Casual relationship
   ____ Committed relationship
   ____ Divorced
   ____ Widowed
   Other (please write in) _____

5) Do you have any children? ____ No ____ Yes
   a. If yes, how many? _____
   b. How many at home? _____

6) How would you describe your ethnicity? _____

Contact Information

Name _____

Date_____

Time _____

Phone Number _____ Prefer Texts? _____

Email address _____

Preferred method of contact? _____

Acceptance and Action Questionnaire for Weight-Related Problems (AAQW)

Below you will find a list of statements. ***Please rate the truth of each statement as it applies to you.*** Use the following scale to make your choice.

1 2 3 4 5 6 7
Never True Always True

1 2 3 4 5 6 7 1. It's OK to feel fat

1 2 3 4 5 6 7 2. When I have negative feelings, I use food to make myself feel better

1 2 3 4 5 6 7 3. I try to suppress thoughts and feelings that I don't like about my body or weight by just not thinking them

1 2 3 4 5 6 7 4. I am not in control of what I eat

1 2 3 4 5 6 7 5. I try hard to avoid feeling bad about my weight or how I look

1 2 3 4 5 6 7 6. I am in control of how much physical activity I do

1 2 3 4 5 6 7 7. When I evaluate my weight or my appearance negatively, I am able to recognize that this is just a reaction, not an objective fact.

1 2 3 4 5 6 7 8. In order to eat well and do physical activity, I need to feel like it

1 2 3 4 5 6 7 9. I need to feel better about how I look in order to live the life I want to

1 2 3 4 5 6 7 10. Other people make it hard for me to accept myself

1 2 3 4 5 6 7 11. If I'm overweight, I can't live the life I want to

1 2 3 4 5 6 7 12. If I feel unattractive, there is no point in trying to be intimate

1 2 3 4 5 6 7 13. If I gain weight, that means I have failed

1 2 3 4 5 6 7 14. I'm in control of my eating behavior

1 2 3 4 5 6 7 15. I don't have what it takes to be healthy for life

1 2 3 4 5 6 7 16. My eating urges control me

Imagine that the following thoughts occurred to you right now.
How valid or believable would each be? For each question, please circle a number from 1 through 7.

1	2	3	4	5	6	7
Not at all believable					Completely believable	

1 2 3 4 5 6 7 17. I need to get rid of my eating urges to eat better

1 2 3 4 5 6 7 18. I am a stable person

1 2 3 4 5 6 7 19. If I eat something bad, the whole day is a waste

1 2 3 4 5 6 7 20. I should be ashamed of my body

1 2 3 4 5 6 7 21. I need to avoid social situations where people might judge me

1 2 3 4 5 6 7 22. I will always be overweight

Three-Factor Eating Questionnaire - 18 (TFEQ-18)

This section contains statements and questions about eating habits and hunger feelings. *Read each statement carefully and answer by marking the alternative that best applies to you*.

	Definitely False	Mostly False	Mostly True	Definitely True
	1	**2**	**3**	**4**
1. When I smell a delicious food, I find it very difficult to keep from eating, even if I have just finished a meal.				
2. I deliberately take small helpings as a means of controlling my weight.				
3. When I feel anxious, I find myself eating.				
4. Sometimes when I start eating, I just can't seem to stop.				
5. Being with someone who is eating often makes me hungry enough to eat also.				
6. When I feel blue, I often overeat.				
7. When I see a real delicacy, I often get so hungry that I have to eat right away.				
8. I get so hungry that my stomach often seems like a bottomless pit.				
9. I am always hungry so it is hard for me to stop eating before I finish the food on my plate.				
10. When I feel lonely, I console myself by eating.				
11. I consciously hold back at meals in order not to weight gain.				
12. I do not eat some foods because they make me fat.				
13. I am always hungry enough to eat at any time.				

Circle the item that is the best answer to each question				
1. How often do you feel hungry?	1 - Only at meal times	2 - Sometimes between meals	3 - Often between meals	4 - Almost always
2. How often do you avoid "stocking up" on tempting foods?	1 -Almost Never	2 - Seldom	3 - Usually	4 - Almost Always
3. How likely are you to consciously eat less than you want?	1 - Unlikely	2 - Slightly likely	3 - Moderately likely	4 - Very likely
4. Do you go on eating binges though you are not hungry?	1 - Never	2 - Rarely	3 - Sometimes	4 - At least once a week
5. On a scale of 1 to 8, where 1 means no restraint in eating (eating whatever you want, whenever you want it) and 8 means total restraint (constantly limiting food intake and never "giving in"), what number would you give yourself? _____				

Physical Activity Tracking Sheet

Remember, only count minutes of physical activity that you do *for the purpose of exercise* – not things like walking the grocery store while you shop. If you are unsure, contact Spencer.

Day 1 (Today)

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 2

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 3

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 4

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 5

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 6

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Day 7

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

_____ Type of exercise _____ Minutes of exercise

Appendix E

Treatment Manual and Handouts

SESSION 1

Building Healthy Lifestyles

Goals for Session 1

1. Overview of group, goals of group, and expectations of group
   a. Purpose of group - eat more healthily and be more active
2. Introduce the role of experiential avoidance in eating patterns and physical activity
   a. Limitations of avoidance as a strategy to deal with pain
   b. Draw on experiences
3. Introduce willingness as an alternative, explain how this is different than what they've been doing
4. Introduce mindfulness and its role in making deliberate choices

Important metaphors for Session 1 (see sample scripts)

1. Sludge in a glass
   a. Things are likely to get more uncomfortable as we start out - this is normal and expected
   b. It's a sign things are going *right*, not going wrong

2. Man in a hole
   a. In what ways have you been digging? What are the important shovels? How might we watch out for this experience becoming a shovel?

Important Exercises for Session 1 (see sample scripts)

1. Acceptance vs. Tolerance
   a. Folded piece of paper with pain words written on it.
   b. Pushing toward vs. laying in lap. How well can you do your life with each level? Do you think you could keep this off of your mind or would it come to dominate?
   c. How might it be different to carry it around.

2. Mindful Eating - Raisin
   a. Go through in detail the sensory experience of the raisin. Going to "really eat this raisin."
   b. How is this different than your regular way of eating?

Homework for Session 1 - Values

1. Why are you here?
2. Lifestyle diary

Session 1: Introduction and Basic Foundations of Treatment & Preparing for Change

Thank you for coming and welcome to our group. This group is for patients with problems related to stress/emotional factors and unhealthy eating habits. We hope that participating in this program will help you learn more about your how to manage your life best even with stress and provide motivation for changing eating habits and managing stress.

1. Group Rules

Let's take a few minutes to see what your ideas are about some helpful ground rules in group.

1. Come on time to sessions.
2. Completing homework assignments is very important to get the most out of this treatment
3. Participate in every session (try not to miss any groups). There are only 4 sessions. If you have to miss more even 1 group, you will be missing 25% of the material.
4. Be respectful of others.
5. Allow everyone a chance to talk.
6. Listen to what others have to say.
7. Be supportive.
8. Be helpful and constructive.
9. Keep a focus on the 'here and now'.
10. Think about what you can do now and tomorrow about your problems rather than what you didn't, should have, or could have done in the past.
11. Complete all activities and exercises
12. Let us know if you are having problems with the group or if you are not satisfied as soon as possible.
13. Maintain group confidentiality.
14. Would you like to add a group rule???

2. Introductions

Let's get to know one another. Let's take about 10-15 minutes. Sample discussion questions include:

1. Your name and what you would like to be called.
2. One thing you struggled with this week (e.g., anger, hurt, resentment, fear, relationship problems)
3. What is your major or career goal?
4. One thing that you would like to do differently in your life right now?

3. Workshop Overview and Goals

1. Workshop is a total of 4 sessions; 1.5 hours; weekly
2. Sessions will include lots of new information and skills.
3. The focus will be looking at your struggle with meeting your health goals, eating and how it's related to stress and difficult emotions, and learning some ways to back off of unhealthy relationship to eating and be more active.
4. We will also emphasize the importance of living a life the way you want, even though eating, inactivity, stress and other emotional struggles are often in the way.
5. We will ask you to get in touch with the reality of pain and challenges in your life related to eating and wellness, and the difference between experiencing pain and creating suffering.
6. Your active participation is very important to maximize your benefits and for the group.
7. We have good evidence that says this approach can work to help people meet their lifestyle goals and make meaningful changes in their lives.

4. <u>What to Expect from Group</u>

Metaphor: *Sludge in Glass*

"This approach can put you on a bit of a roller coaster. All kinds of different emotions might emerge: interest, boredom, anxiety, sadness, clarity, confusion, and so on. It is like cleaning out a dirty glass with sludge in the bottom: the only way to do it is to stir up the dirt. So some stuff might get stirred up, and for a while, things may look worse before they look better. It is not that it is overwhelming - it is just that you should be prepared to let show up whatever comes up."

- We will talk about difficult things and how this is related to your struggle with overeating and other problematic health behaviors. You will likely feel sad, angry, anxious, and uncomfortable at times. This response is natural and to be expected.

- You will see expressions of suffering and emotion from others while in this group. This is difficult work and difficult emotions are expected.

- We will take these issues seriously and will never attempt to use them to our advantage or for personal gain.

- You are free to express emotions as you see fit. Do not feel a need to hide them or keep them buried. Again, we will not ever consciously use these emotional expressions in a harmful or inappropriate way.

- We ask that you make a conscious commitment to taking part to the best of your

abilities. If you cannot do so, this may not be the best time for you to be here.

5. The Power of Pain
   - What role has pain (mental, emotional) played in getting you here?
     - Stress, shame, frustration, fear?
   - What do you do with pain or discomfort when they show up? How do you work to get rid of them? How does food and eating play into your strategies of "dealing with" pain?
   - How has this played into your lifestyle difficulties?
   - Look back at your life, how old is the pain that brought you here? How long has the fight been going on? How much of it is tied up in weight, eating, exercise?

Metaphor: *"Man in a Hole Digging"*

1. Has your fight to get rid of your negative feelings and thoughts related to weight been working?
2. Did these "solutions" help you in living the life you wanted to live?
3. Painful feelings, thoughts, memories are facts of life, but the *struggle* with this pain is often more damaging.
4. How is this related to your struggle with weight?
   Consider this:
   - Difficulty in losing and maintaining weight is common and supported in the literature (80-95% of people don't maintain weight loss)
   - What if we can all agree on weight loss as not the goal for right now?
   - What might it be like to accept your weight as it is right now, without trying to fix it?
   - What could our focus be if not to lose weight?

So what does this mean for people struggling with weight issues?

- What really happens is that we consume a certain amount of calories, we burn a certain amount, we store energy, and our body takes a certain shape
- When language gets thrown on top of that, you get "I'm ugly, weak, a bad person, I have no self-control, others look down on me, think I'm lazy, I'm unlovable"
- Feelings of sadness, depression, anxiety.
- Spend much time thinking or worrying a lot about being overweight, losing control of eating, what other people think of you.
- And these thoughts, feelings, sensations, urges, etc… can come up at any time, without warning. Just part of being human and using language. Kind of a raw deal, huh?

<u>So what's the alternative?</u>

- Willingness to experience what shows up, as it shows up, without fighting against it.
    - Quicksand Example
- Efforts to control (avoid, regulate, etc).
    - If you're not willing to have it, you keep struggling
    - The more you struggle, the more you have it
    - What do we "struggle to have" related to eating? Exercise?
- Willingness vs. Tolerance

<u>What is Mindfulness?</u>

- Non-judgmental acceptance and noticing of experience
- Mindfulness is a way of paying attention that is taught through exercises, where you learn to regulate your attention by focusing non-judgmentally on internal experiences such as thoughts, emotions, cravings, physical sensations.
- You learn to observe these without evaluating their truth or importance, and without trying to escape, avoid, or change them. That is, you can learn to just notice.
- Mindfulness practice is thought to result in increased self-awareness and acceptance, reduced reactivity to thoughts and emotions, and improved ability to make adaptive choices about responding to aversive experiences

Mindfulness Exercise: *Eating Raisins*
Debrief

<u>Rigged game, game that you can't win.</u>

Weekly Homework Session 1

1. Why are you here???

   Each person in this group may have similarities such as hometown, outside interests, or careers. Although you also likely have some differences among yourselves, you all have the common experience pain. The particular problems related to your struggle may differ, but all of you have some level of struggle that gets in the way of living your life. Pain is inevitable…is it possible to live with pain, experience it differently, and not be pushed around by it so much. This can help us to change your eating behavior and get you more active. Remember, pain is inevitable, suffering is a choice.

   - Please take a few moments to contemplate reasons that you are participating in this group.

     _____

     _____

     _____

   - Motivation for changing your lifestyle and eating habits?

     - What are some reasons why you want to change your lifestyle habits now?

       _____

       _____

       _____

     - What would your life look like if your lifestyle concerns weren't a problem?

       _____

       _____

       _____

       _____

2. Lifestyle Daily Diary (See Attached Worksheet to help you)

Session 1: Introduction and Basic Foundations of Mindfulness & Preparing for Change

Metaphor: *Sludge in Glass*

"This approach can put you on a bit of a roller coaster. All kinds of different emotions might emerge: interest, boredom, anxiety, sadness, clarity, confusion, and so on. It is like cleaning out a dirty glass with sludge in the bottom: the only way to do it is to stir up the dirt. So some stuff might get stirred up, and for a while, things may look worse before they look better. It is not that it is overwhelming - it is just that you should be prepared to let show up whatever comes up."

Metaphor: *"Person in a Hole Digging"*

1. Has your fight to get rid of your negative feelings and thoughts related to weight been working?
2. Did these "solutions" help you in living the life you wanted to live?
3. Painful feelings, thoughts, memories are facts of life, but the *struggle* with this pain is often more damaging.
4. How is this related to your struggle with weight?

So what does this mean for people struggling with weight issues?

- What really happens is that we consume a certain amount of calories, we burn a certain amount, we store energy, and our body takes a certain shape
- When language and mindiness gets thrown on top of that, you get "I'm ugly, weak, a bad person, I have no self control, others look down on me, think I'm lazy, I'm unlovable"
- Feelings of sadness, depression, anxiety, frustration.
- Spend much time thinking or worrying a lot about being overweight, losing control of eating, what other people think of you.
- And these thoughts, feelings, sensations, urges, etc… can come up at any time, without warning. Just part of being human and using language. Kind of a raw deal, huh?

<u>What is Mindfulness?</u>

- Mindfulness is a way of paying attention that is taught through exercises,

where you learn to narrow your attention by focusing non-judgmentally on internal experiences such as thoughts, emotions, cravings, physical sensations.

- You learn to observe these without evaluating their truth or importance, and without trying to escape, avoid, or change them. That is, you can learn to just notice.
- Mindfulness practice is thought to result in increased self-awareness and acceptance, reduced reactivity to thoughts and emotions, and improved ability to make adaptive choices about responding to aversive experiences

SESSION 2

Building Healthy Lifestyles

Goals for Session 2

1. Continue with mindfulness
2. Introduce control as the problem
    a. Differences between control in internal and external worlds
    b. Clean and dirty pain
    c. Rules and rule-governed eating
        i. Good foods and bad foods
3. Willingness and acceptance
    a. If you're willing to have it, you won't; if you're not willing to have it, you will
    b. Acceptance vs. tolerance
    c. Acceptance vs. "giving up"
        i. What does our mind say about "acceptance."
        ii. What is acceptance *not?*
4. Values
    a. Review homework
    b. What are values?
        i. vs. goals
    c. What are your health-related values?
5. Step Forward
    a. Behavioral commitment - something you wouldn't have normally done

Important metaphors for Session 2

1. Feeding the tiger
    a. See script
2. Good foods and bad foods
    a. The drawbacks of these rules - how helpful have they been?
3. Joe the Bum
    a. What does it cost us to spend all of our time keeping the bum out? Do we enjoy any of the party?
4. Double-Sided Coin
    a. Willingness to buy all the things we want that come along with pain, discomfort, and things we don't want.
5. Rumble Strips
    a. Clues that we are edging away from values - What are your health-related rumble strips? How do you know when you're starting to slip?

Important Exercises for Session 2

1. Mindful body scan
2. Mindful ice cream + debrief
3. Lifetime contribution award
4. Values target
5. Step forward behavioral commitment

Session 2: Control is the Problem, Why Willingness? Introduction to Values

1. Mindfulness
   - Exercise: *Mindful Body Scan*

2. Homework & previous week review
   - Review: Stress, Man in a hole, Mindfulness
   - Homework:
     - Lifestyle Daily Diary: Please Turn These In (don't forget your initials)
     - Getting at Values: Why do you want to change? What is your motivation?
     - If you did not do the homework, how did your mind talk you out of doing it?

3. Control is the Problem

   - Controlling our Internal Worlds versus our External Worlds
     - As humans, we are very good at fixing things. If we have a car that doesn't work, we are not going to keep it around for 20 years; we are going to get one that goes or taking it to a mechanic!
     - We often use same problem solving strategies on our internal worlds as we do for our external worlds. (Example: Running from a dark alley versus Running from the thought "I am not good enough.")

   - How can we identify internal experiences? (thoughts, feelings, memories, cravings)
     - What is the relationship between internal experiences and eating/exercise habits?
     - How does avoidance of internal experiences work for you?

   - Role of Control
     - Can we really control and/or suppress our feelings?
       - Metaphor: *Feeding the Tiger*

- Pull of avoidance—why do we do it? (Group discussion)
    - Behavioral control of internal experiences doesn't work, especially long-term.
    - Your life becomes increasingly more about trying to not think or feel a certain way, or not coming into contact with painful inner experiences.
    - Getting rid of painful "stuff" is not the goal for right now.
    - Instead of focusing on getting rid of all of these negative experiences and using food to escape it, let's focus on being in the here and now and being willing to experience whatever shows up.

Exercise: *Mindful Ice Cream*

Exercise: *Good/Bad Foods, Helpful/Unhelpful Foods*

- Metaphor: *Clean versus Dirty Discomfort*

4. Willingness and Acceptance

- What does it look like to be willing?
    - You notice you have been struggling
    - You get ready to give up the struggle
    - You tell yourself, I can't fix the pain/distress, and it's here anyway, so just notice
    - You put the welcome mat out for the emotions you have been struggling with

- Metaphor: *"Joe the Bum"*

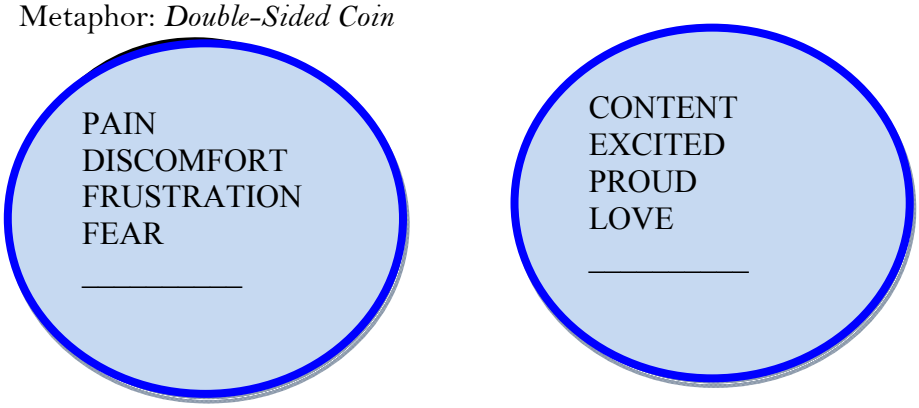
- Why Willingness?
  - What are some reasons why they might want to be willing to experience difficult internal experiences?

    _____

    _____

    _____

  - Examples of reasons to be Willing
    - Because when you struggle against emotions, the struggle increases the pain and makes them stronger.
    - Because when you move away from the pain that you meet while living the life you value, you also move away from a rich life.
    - Because when you try to close yourself off from the painful memories of the past, you also close yourself off from the helpful things you have learned from your past.
    - Because you have seen that being unwilling just doesn't work.
    - Because you have suffered enough.
- Metaphor: *Double-Sided Coin*



4. Your Valued Direction

- What is your value about wellness?
  - That is, if eating habits and weight were not an issue for you, what would you do?

_____

_____

- Getting you in touch with your valued direction.
  - Exercise: *Lifetime Contribution Award*

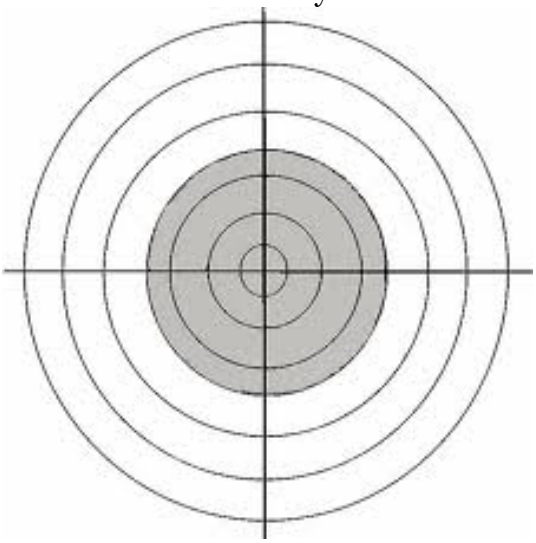
- Defining Valued Directions
  - Values are perfect – they cannot be judged or "evaluated".
    - There is no right, or wrong, or better, or worse values
  - Values are a choice. You cannot give any real reasons for them.
    - Why do you value something? It is almost impossible to justify them.
    - So it is not possible to say, "I care about loving others because…"
  - Values are different from goals.
    - Values are like a direction you want to go, for instance, "West"
    - Goals are destinations you want to get to when you travel "West".
    - Goals give us evidence that we're on the way toward a value

Value	Goal
Example: I care about learning and gaining knowledge It is important to be a loving parent	Example: Earning a degree or diploma from college Playing everyday for half an hour with my child
Not specific and time limited.	Are specific and can have a time component – "I will complete my assignments"
You cannot arrive at it but **you can** live each moment of the rest of your life in a valued way.	You can arrive at it. You can say 'I've accomplished it' and move on to the next goal.

Metaphor: *Rumble Strips*

5. Values Commitment
   - Please complete Value Target Statement

     In the target below right down your values and come to the front of the group and declare what you choose to have your life stand for from here on.



     I value _____, _____, and _____.
     (e.g., "I value my health, family, and education)

- Starting this week, we will ask you to make a single "Step Forward" to follow through prior to next session in the direction of one of your values.
  - A Step Forward is a physical activity that you would not have taken before now.
  - Pick something that you are "Willing" to do – That is, not necessarily something that's comfortable!
  - Willingness is like jumping – you have to use both feet, you have to put your body in the air, and you have to have faith that you will land. You don't get to step down.
  - This Step Forward isn't 10 steps – Don't pick a marathon as a warm up!
  - You can pick something relatively easy to do – but keep your willingness to experience discomfort high when you do this and don't give up half way through it.
  - Write your Step Forward down.

My Step Forward is _____

Exercise: Stand and Commit To Group Values Statement and Step Forward

Weekly Homework Session 2

1. Valuing Healthy Living Worksheet
2. Step Forward: Will follow-up with you about how it next week
3. Mindfulness Practice: Walking Mindfulness
4. Lifestyle Daily Diary

Valuing Healthy Living

What is a value?

A value is something we choose to be important to us. Simply stated, a value is something that matters to us. A value is a choice we make to give our life meaning. It isn't a destination – it's a direction we walk.

What *isn't* a value?

A value *isn't* mindy. It's a choice we make when we get out of our heads.
A value *isn't* a goal. We never arrive at a value. For example, if we value "wellness," when do you arrive at "well?" How do you know when you're there? What happens if you stop walking toward "wellness?"

What does it mean to value?

Values are choices – we choose what matters to us!

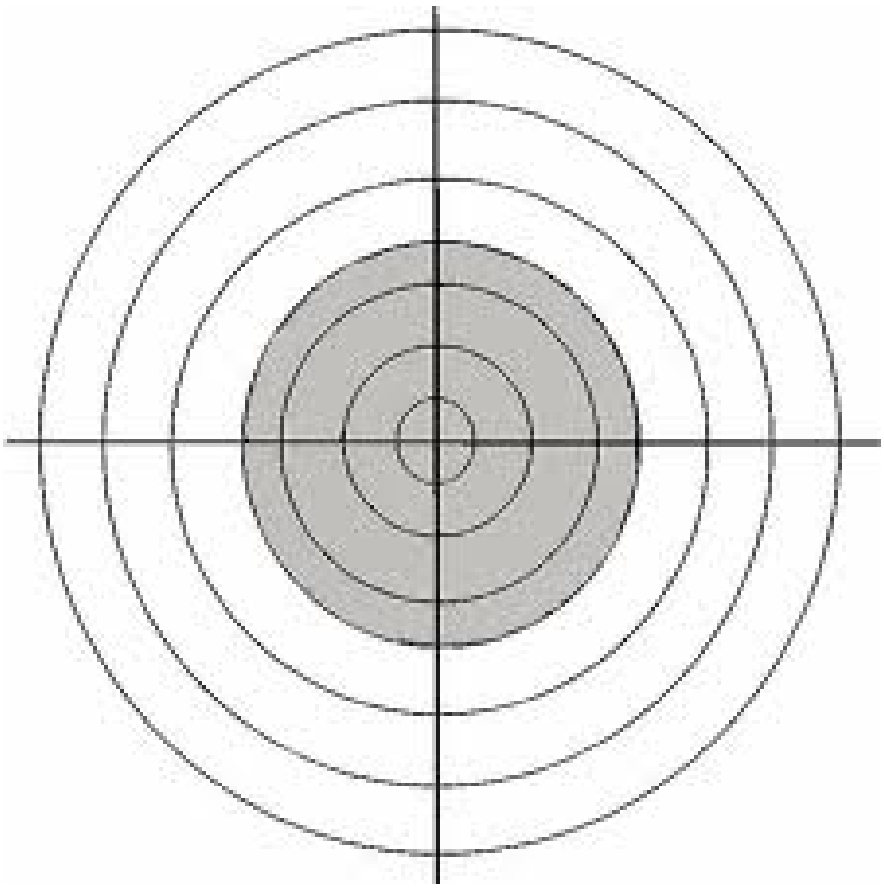
What matters about a healthy lifestyle? How do you value it? How closely are you living it?

What might be some clues that you're walking toward your wellness value?

How can you demonstrate your choosing to value today? If a stranger was watching you value, what would he/she see?

Valuing Healthy Living Target

How closely are you living your valued lifestyle? If the bullseye is living exactly consistent with your lifestyle value, how close would you be to it? Mark on the target below.



What can you do over the next week to move more toward the center?

Walking Mindfulness

Try the following steps to explore mindfulness through walking meditation:

- Choose a place where you can go for a walk (ideally) with minimal external distractions/stimulation, such as a walking/hiking trail, park, stairwell, or even within your home (if this is impossible due to the environment, consider it as an even more challenging opportunity to strengthen mindfulness).
- Begin the brief mindfulness exercise by actively turning your focus toward your breath. Simply notice it and tune into it.
- Turn your awareness toward your physical presence as you continue to breathe.
- Notice the sensations of your feet, legs, hips, stomach, chest, arms, shoulder, neck, and head as you move.
- Turn your mindful awareness toward the physical activity and sensations that you are experiencing in the moment, noticing and accepting your body's movements and allowing yourself to experience a sense of vitality.
- By remaining focused on your breath and becoming fully attuned to your physical presence and movements, you are checked in to this moment… your focus has shifted away from ruminative thoughts and desires to isolate.
- Notice any emotions, thoughts, or physical sensations that you experience without trying to change them and genuinely tune in to your body's movements.

Remember that physical activity without any mindful engagement (acting on automatic pilot or using physical activity to "check out") is a temporary solution that is unlikely to result in genuine connection with yourself or the present moment.

Take a few moments after you completing your mindfulness activity to process the experience.
Write some notes down if it helps and bring in to discuss in the next session.

Session 2: Control is the Problem, Why Willingness? Introduction to Values

6. Mindfulness
   - Exercise: *Mindful Body Scan*

7. Control is the Problem

   - Controlling our Internal Worlds versus our External Worlds
     - As humans, we are very good at fixing things. If we have a car that doesn't work, we are not going to keep it around for 20 years; we are going to get one that goes or taking it to a mechanic!
     - What is the relationship between internal experiences and eating/exercise habits?
     - How does avoidance of internal experiences work for you?

   - Role of Control
     - Can we really control and/or suppress our feelings?
     - Metaphor: *Feeding the Tiger* – If we keep avoiding, we keep feeding the tiger that grows up to control us

   Pull of avoidance—why do we do it? (Group discussion)
     - Behavioral control of internal experiences doesn't work, especially long-term.
     - Your life becomes increasingly more about trying to not think or feel a certain way, or not coming into contact with painful inner experiences.
     - Getting rid of painful "stuff" is not the goal for right now.
     - Instead of focusing on getting rid of all of these negative experiences and using food to escape it, let's focus on being in the here and now and being willing to experience whatever shows up.

Discussion/Exercise: *Good/Bad Foods, Helpful/Unhelpful Foods*

   - Metaphor: *Clean versus Dirty Discomfort* – Everyone has pain, and we compound it by being unwilling to have it. We pile layers of suffering *around* our pain.

5. Willingness and Acceptance

   - What does it look like to be willing?
     - You notice you have been struggling
     - You get ready to give up the struggle
     - You tell yourself, I can't fix the pain/distress, and it's here anyway, so just notice
     - You put the welcome mat out for the emotions you have been struggling with

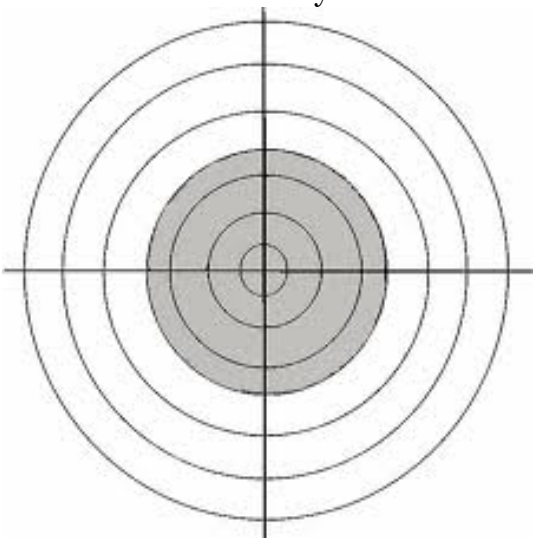
- Metaphor: *"Joe the Bum"* – By being willing, we get to enjoy our life, even the painful parts!

8. Your Valued Direction

- What is your value about wellness?
  - That is, if eating habits and weight were not an issue for you, what would you do?
  - Values are perfect – they cannot be judged or "evaluated".
    - There is no right, or wrong, or better, or worse values
  - Values are a choice. You cannot give any real reasons for them.
    - Why do you value something? It is almost impossible to justify them.
    - So it is not possible to say, "I care about loving others because…"
  - Values are different from goals.
    - Values are like a direction you want to go, for instance, "West"
    - Goals are destinations you want to get to when you travel "West".
    - Goals give us evidence that we're on the way toward a va

9. Values Commitment
   - Please complete Value Target Statement

     In the target below right down your values and come to the front of the group and declare what you choose to have your life stand for from here on.



     I value _____, _____, and _____.
     (e.g., "I value my health, family, and education)

- Starting this week, we will ask you to make a single "Step Forward" to follow through prior to next session in the direction of one of your values.

- A Step Forward is a physical activity that you would not have taken before now.
- Pick something that you are "Willing" to do – That is, not necessarily something that's comfortable!
- Willingness is like jumping – you have to use both feet, you have to put your body in the air, and you have to have faith that you will land. You don't get to step down.
- This Step Forward isn't 10 steps – Don't pick a marathon as a warm up!
- You can pick something relatively easy to do – but keep your willingness to experience discomfort high when you do this and don't give up half way through it.
- Write your Step Forward down.

My Step Forward is _____

Exercise: Stand and Commit To Group Values Statement and Step Forward

SESSION 3

Building Healthy Lifestyles

Goals for Session 3

1. Revisit Values
   a. Review values homework
2. Introduce Defusion
   a. How does it relate with mindfulness
   b. Getting hooked on thoughts
   c. The power of thoughts and language
3. Observer self
   a. Notice as you watch your thoughts, there's a *you* there noticing
4. Values and Committed Action
   a. Driving the bus

Important Metaphors for Session 3

1. Boxes on a conveyor belt (or thoughts on a cloud, leaves on a stream)
   a. Doesn't matter which is done, just a thought watching exercise
2. Chessboard
   a. We feel like the pieces. It seems like we're engaged in this game that never ends. But really we're the *place* where the thoughts are playing out. It takes a little pressure off of who wins and loses – we're safe either way.

Exercises in Session 3

1. Boxes on conveyor (or other thought watching)
2. Milk milk milk
3. Step forward
   a. Another step forward – What does your mind say about changing? What are the thoughts do you notice that are sticky?
   b. How might you get unhooked?
4. Homework
   a. Defusion – attached sheet

Session 3: Values, Committed Action, and Cognitive Defusion

10. Mindfulness

- Exercise: *Mindful Breathing*

11. Homework & previous week review

- Review: Control as the Problem, Willingness, Mindfulness, Values/Goals
- Homework:
  - Briefly Review Control as the Problem, Willingness, Mindfulness, Values/Goals
  - Discuss ACT daily diary, Mindful Eating Practice, Steps forward??
  - If you did not do the homework, what did your mind tell you to talk you out of it?

12. Values

- Valuing Healthy Living Questionnaire
  - What did you learn? How do you value wellness?
  - Are there areas that you aren't living your values? Are willing to work toward and discuss with the group?
  - What are some thoughts and feeling that come up related to these areas?
  - How does your relationship with food move you closer or further away from your values?

- What it is like to hear about other group members struggles with avoidance of valued living?

13. Cognitive Defusion

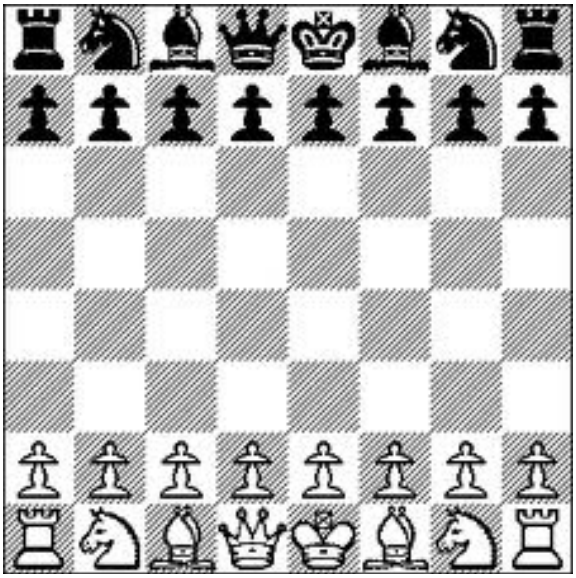
- The Power and Limit of thoughts
  - Thoughts can be very powerful
  - They can make us feel things that are not there
  - Example: Bite a lemon, Scratch the chalkboard, a loved one just died
  - Just thinking these things creates feelings in your mind and body
- Thoughts are also very limited
  - They cannot substitute for direct experience and action.
  - You cannot walk across a room by thinking about it – no matter how detailed the picture
  - What are some of the thoughts about eating that you get hooked on?
  - You can buy into them ***OR*** you can see them as just thoughts.
- How do we get hooked by thoughts?
  - Thoughts seem to be always based in real life.
  - How does getting caught up in your thoughts get in the way of eating

healthfully and exercise?
  - Do they have a strong influence over your actions?
  - Have group brainstorm: In what situations does your mind manage to hook you? What sort of things does it say to you about your weight that hook you? How do you manage to unhook yourself?
- Getting "Unhooked"
  - Noticing
  - Labeling thoughts
  - Having a though versus buying a thought

- Defusion/Mindfulness Exercise: "Boxes on a Conveyor Belt"

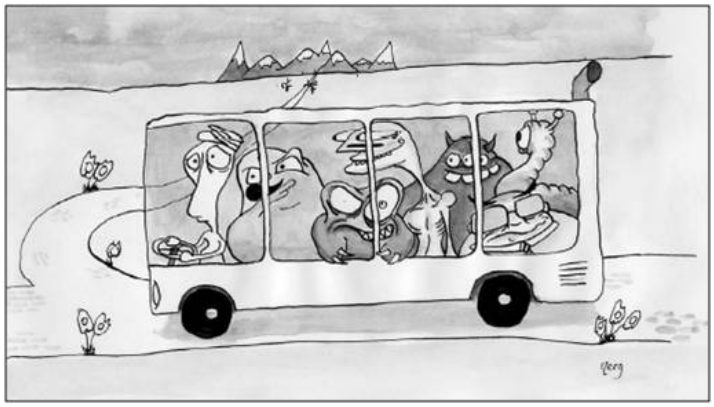
We can't control what shows up. We can alter the power that it has on us!
- Milk milk milk
- Notice how spending more time with this thought changed how powerful it was.

- In autopilot, our thoughts seem to be us.
- However, notice how when you watched those thoughts on the belt, there was a *you* there watching them!
- What thoughts showed up/usually show up about eating or exercising? Weight?
- Metaphor: ***Chessboard***



Values and Committed Action

- Living your values
  - Metaphor: *Passengers on a Bus*



- Values Commitment
  - We would like you to make another Step Forward this week in the direction of one of your values.
  - My Step Forward this week is_____
- Exercise: Stand and Commit To Group Step Forward

Weekly Homework Session *3*

5. Complete Step Forward???
6. Mindfulness/Defusion Practice (See attached sheet)
7. Lifestyle Daily Diary

Defusion Techniques: Being Mindful of your Mind

This next week set time aside each day to practice some of the following techniques. The best time to use these strategies is 1) Before, during or after a challenging social situation; 2) When your thoughts aren't helpful; 3)You are mentally somewhere else or in some other time; 4) Your mind feels judgmental; 5) Your thoughts feel old and familiar

Remember: The aim of backing off of thoughts is not to get rid of a thought or decrease anxiety. The aim is simply to see the thought for what it is: a bunch of words showing up in your mind, and to let it be there without buying into it.

This is like any other skill: The more you practice, the better you get at it

1. The Mind
   Treat "the mind" as an external event, a passenger, almost as a separate person (e.g., "Well, there goes my mind again" or "My mind is worrying again").

2. Thought Labeling
   Label your thoughts as thoughts (e.g., "I am having the thought that I'll be too nervous to speak") or label the type of thought (e.g., "I am having the judgment that my voice sounds weird" or "I am having the prediction that the salesperson will be annoyed if I return it", etc.).

3. Get off your but!
   Replace "but" with "and" (e.g., "I would like to go to the party but I am afraid I will be anxious" becomes "I would like to go to the party and I am afraid I will be anxious").

4. Use a variety of vocalizations
   Say the thought very slowly, say it in a different voice, sing it, etc.

5. Thank your mind
   Thank your mind when you notice it butting in with worries and judgments (e.g., "Thank you mind. You're doing a great job of mind reading today"). This is not sarcasm…after all, the mind is doing exactly what it was designed to do all of those thousands of years ago- "problem solve" and avoid danger.

6. Say the thought out loud quickly and repeat it until it loses its meaning (e.g., I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring, I'm boring,……..).

7. Imagine that thoughts are like:
   - Internet pop-up ads.
   - A cell phone you can't turn off (e.g., "Hello. This is your mind speaking)
   - Clouds floating across the sky.
   - A waterfall. You're standing behind it, not under it.
   - Guests entering a hotel. You can the doorman: you greet the guests but you don't follow them to their rooms.
   - Actors on a stage. You can watch the play; you don't need to get on stage and perform.
   - A passing parade. You can watch the floats pass by. You don't have to climb on board.
   - Suitcases dropping onto a conveyor belt at the airport. You can watch them pass by, without picking them up.

8. Buying thoughts
   Distinguish between thoughts that just occur and the thoughts that are believed (e.g., "I guess I'm buying the thought that I'm boring").

9. And how has that worked for me?
   When you are buying a thought, back up for a moment and ask yourself, "How has that worked for me?" and if it hasn't worked ask, "Which should I be guided by, my mind or my experience?"
10. Create your own strategy

Session 3: Values, Committed Action, and Unhooking

14. Mindfulness

- Exercise: *Mindful Breathing*

15. Homework & previous week review

- Review: Control as the Problem, Willingness, Mindfulness, Values/Goals
- Homework:
  - Briefly Review Control as the Problem, Willingness, Mindfulness, Values/Goals
  - Discuss ACT daily diary, Mindful Eating Practice, Steps forward??
  - If you did not do the homework, what did your mind tell you to talk you out of it?

16. Values

- Valuing Healthy Living Questionnaire
  - What did you learn? How do you value wellness?
  - Are there areas that you aren't living your values? Are willing to work toward and discuss with the group?
  - What are some thoughts and feeling that come up related to these areas?
  - How does your relationship with food move you closer or further away from your values?

- What it is like to hear about other group members struggles with avoidance of valued living?

17. Unhooking from thoughts

- The Power and Limit of thoughts
  - Thoughts can be very powerful
  - Just thinking these things creates feelings in your mind and body
- Thoughts are also very limited
  - They cannot substitute for direct experience and action.
  - You can buy into them ***OR*** you can see them as just thoughts.
- Getting "Unhooked"
  - Noticing
  - Labeling thoughts
  - Having a though versus buying a thought

We can't control what shows up. We can alter the power that it has on us!

18. Living your values

  - Metaphor: *Passengers on a Bus*
  - Who's driving? Where do you want it to go? What are you willing to take along for the ride?

  - My Step Forward this week is_____

SESSION 4

Building Healthy Lifestyles

Goals for Session 4

1. Review main topics from past three weeks
    a. Control as problem
    b. Willingness and openness
    c. Mindfulness and non-judgmental stance
    d. Having vs. Buying thoughts
2. Review Homework
3. Revisit self-as-context/observer self
    a. How is it to be the noticer?
    b. In what ways do "shoulds" get in the way of you acting in a values-consistent way with weight?
4. Revisit Values
5. Committed action and barriers to change
    a. Priorities

Important Metaphors for Session 4

1. Path up the mountain
    a. There are lots of things to do with this metaphor. Some are:
        i. There are many ups and downs. Sometimes it feels like you aren't going up anymore, but sometimes you have to head down a little before you climb up more.
        ii. The path has many twists and turns. We don't always know where it's headed, but it is always going forward.
        iii. It's important to stop and look around. Be in the moment: how is the view changing from switchback to switchback?
        iv. There is always more path ahead. We never arrive at a destination and the path is the purpose, not the end.
2. Riding a bike – Relapse prevention
    a. Always know how to ride – just a matter of getting back on. Choosing to get back on.
3. Rumble strips
    a. How will you know when you're veering off the road of a valued life? What will be the cues that you're slipping?

Important Exercises for Session 4

1. Rocks in the jar – Priorities
2. Revisiting Values Target
3. Step Forward – Committed action and willingness
4. Complete post-measures

Session 4: Self as Context, Barriers to Change & Commitment to Values-Related Goals

1. Mindfulness
    - Exercise: Five Senses

2. Review & Homework
    - Briefly Review Control as the Problem, Willingness, Values/Goals
    - Lifestyle daily diary, Getting Unhooked Practice, Steps Forward??
    - Review "Passengers on a Bus"
    - If you did not do the homework, what excuses did your mind tell you?

3. Self-as-Context
    - Developing Flexibility
        - As humans we often hold a rigid view of who we are.
        - What are some common labels you use to describe yourself (i.e., "I am a procrastinator," "I am lazy"). Write down a few here:

          _____

          _____

          _____

        - How do rigid views about who we are impact our ability to make lifestyle changes stick?

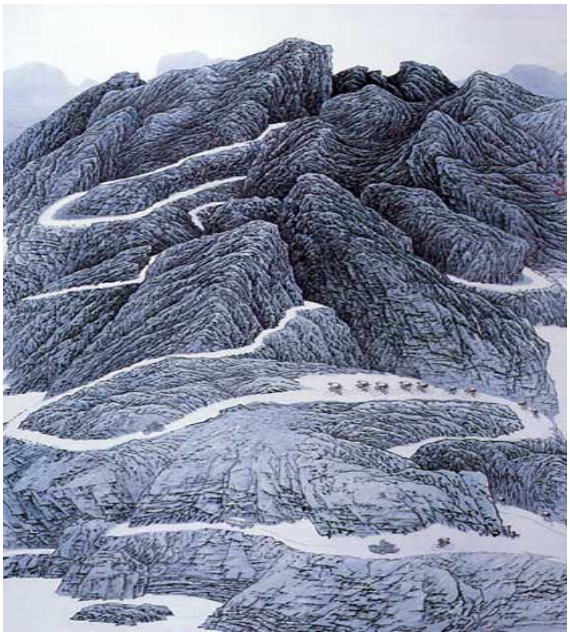
    - Exercise: The Observer Self

        - How is it to examine previously avoided thoughts and feelings in an open and nonjudgmental way?

        - How can learning to notice thoughts without acting on them, being controlled by them, or believing them help you change?

4. Values Revisited
- *Rocks in Jar Exercise*
- How can you make sure to prioritize wellness?
- How can you make time for lots of different values?

5. Committed Action & Barriers to Change
    - Walking in the direction of your values
    - Metaphor: Path up the Mountain



6. Barriers: What gets in the way?

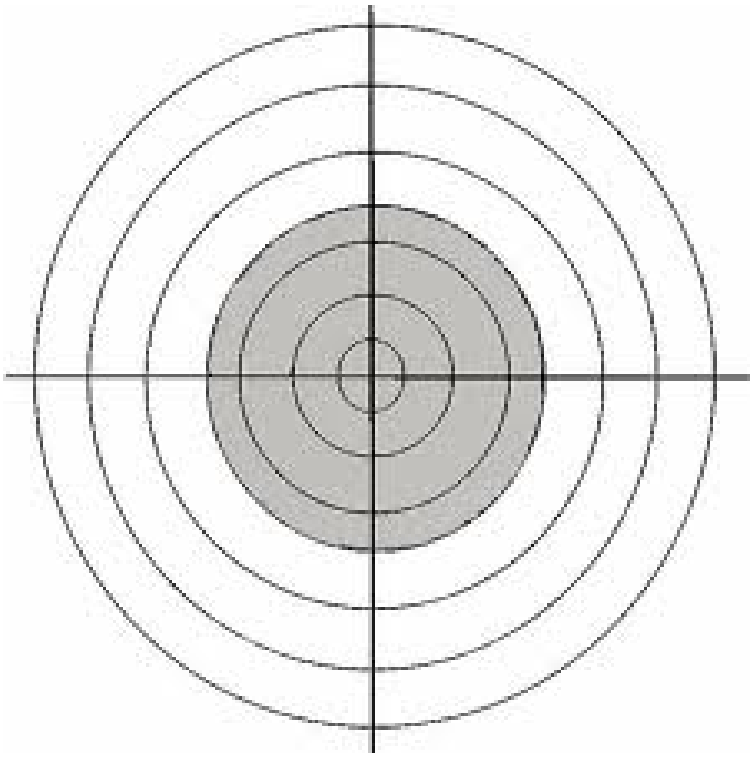
- Two important and common traps: Believing your Mind and avoiding discomfort
- Believing your mind
    - Remember, we get really used to getting hooked by thoughts
    - Some thoughts are so consistent, so powerful that we easily attach to them.
    - Thoughts can sabotage our efforts to change
        - "I've been good all week."
        - "I worked out hard today."
        - "It's never going to work anyway."
- What has gotten in the way of your efforts to change in the past?
- Avoiding discomfort
    - Environmental triggers can produce emotional discomfort and lead to unhelpful eating or other avoidant behaviors (certain foods, family, friends, work)
    - How have you been avoidant of these in the past?
    - How have you used food to be avoidant?
    - How can avoiding these situations get in the way of long-lasting change?
    - How could you use your skills from this group to be more willing?

7. Revisit Valuing Healthy Living
    - In the past few weeks have you noticed any changes in how you are living?
    - Have you noticed experiencing your values differently?
    - What areas are you most fearful to address?
    - How is avoidance showing up for you even in this moment?

8. Slip vs. Relapse
   Metaphor: *Riding a bike*
   - Although the group will end, what you have learned about yourselves will endure.
   - You will always have this history. It's like riding a bike. Once you get the skill of riding, you'll have it forever.
   - Even if you don't ride for a while, when you get back on the bike, you'll find that you've had the knowledge and the skills all along. It's just a matter of *choosing* to get back on the bike.
   - We can catch ourselves in the beginning stages of slipping and recommit
     - *Rumble Strips*
   - What will an eating or exercise slip look like? What can you do?

Revisit: Value Target Statement & Step Forward:

How closely have you been living your wellness value?



I value _____, _____, and _____.
(e.g., "I value my health, family, and spirituality)

- My Step Forward is _____.
- My willingness (on a scale of 0-10) to work on completing my goals, even with the barriers? _____.

9. Exercise: Stand and Commit To Group: Values Statement, Step Forward, Willingness

Appendix F

Spaghetti Plots of Intervention Participants

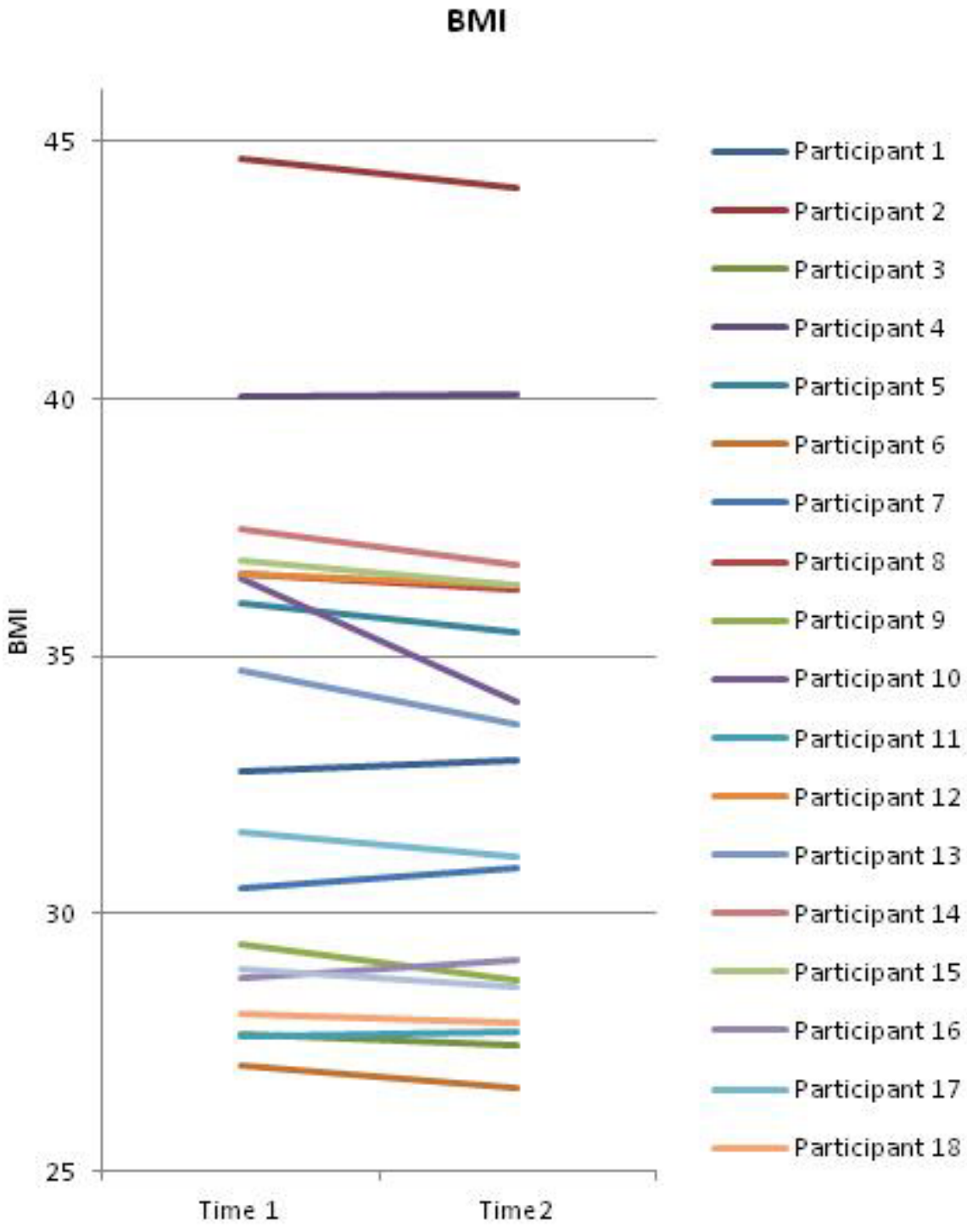


Figure F1. Spaghetti plot for BMI by participant.

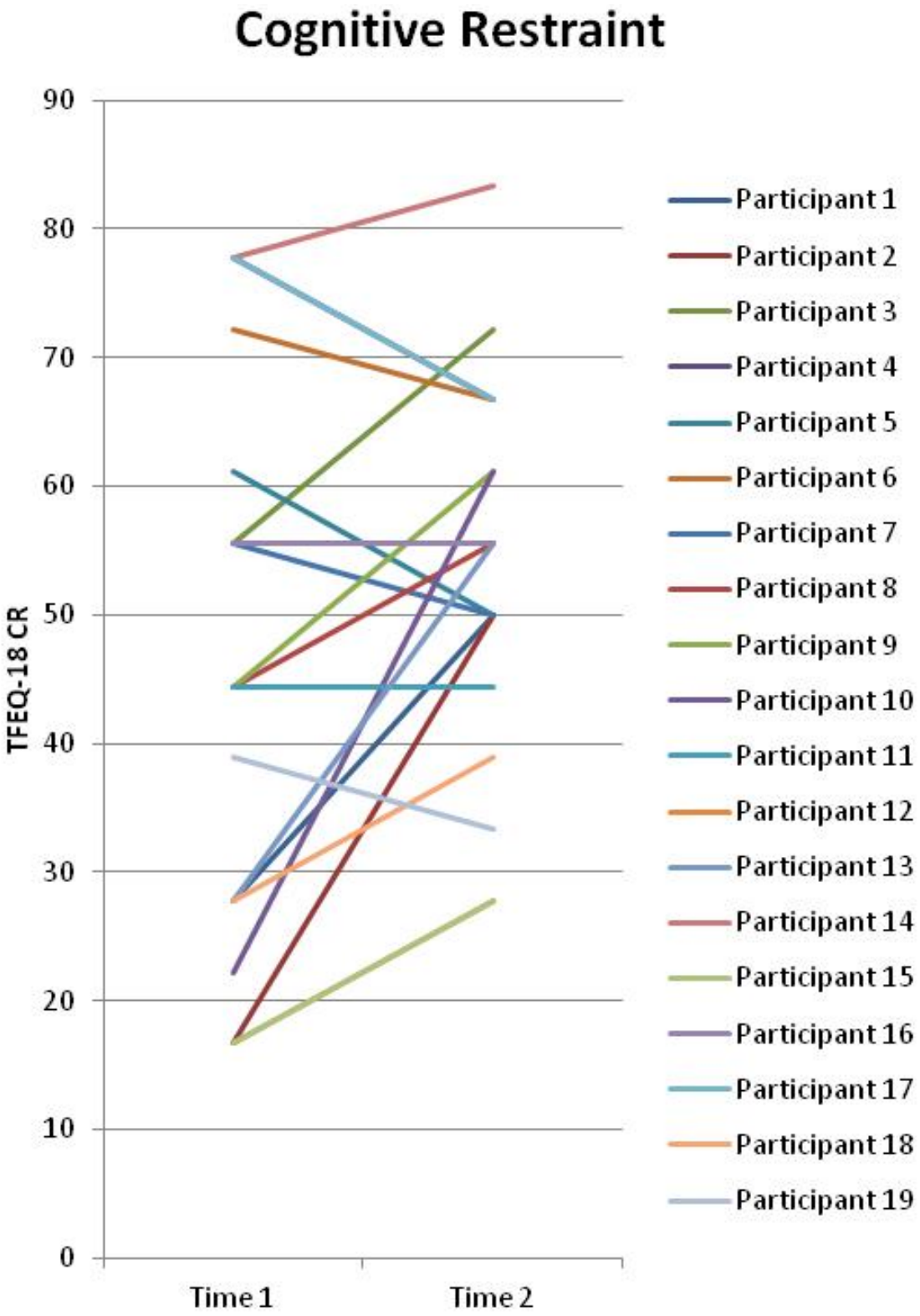


Figure F2. Spaghetti cognitive restraint for BMI by participant.

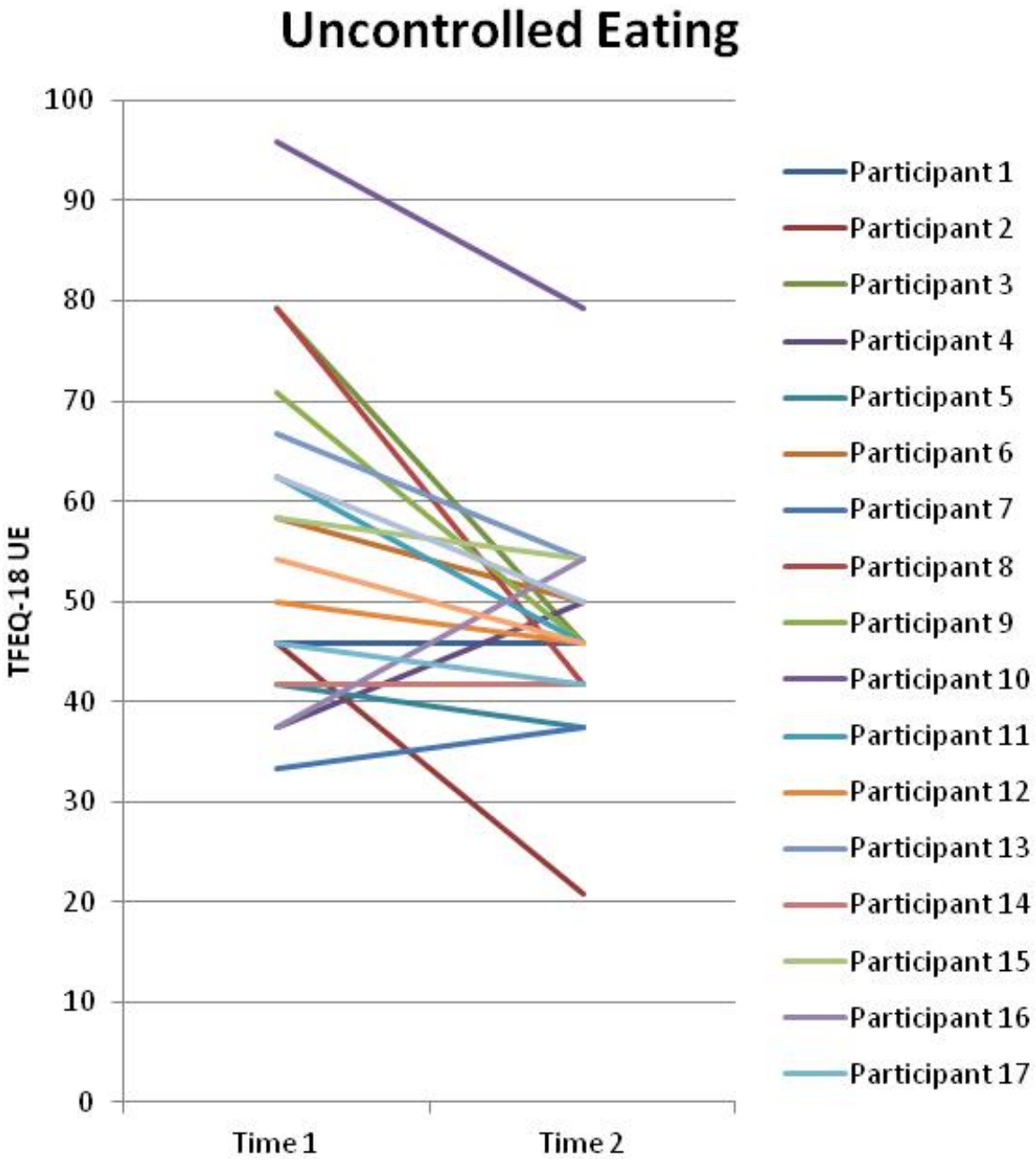


Figure F3. Spaghetti plot for uncontrolled eating by participant.

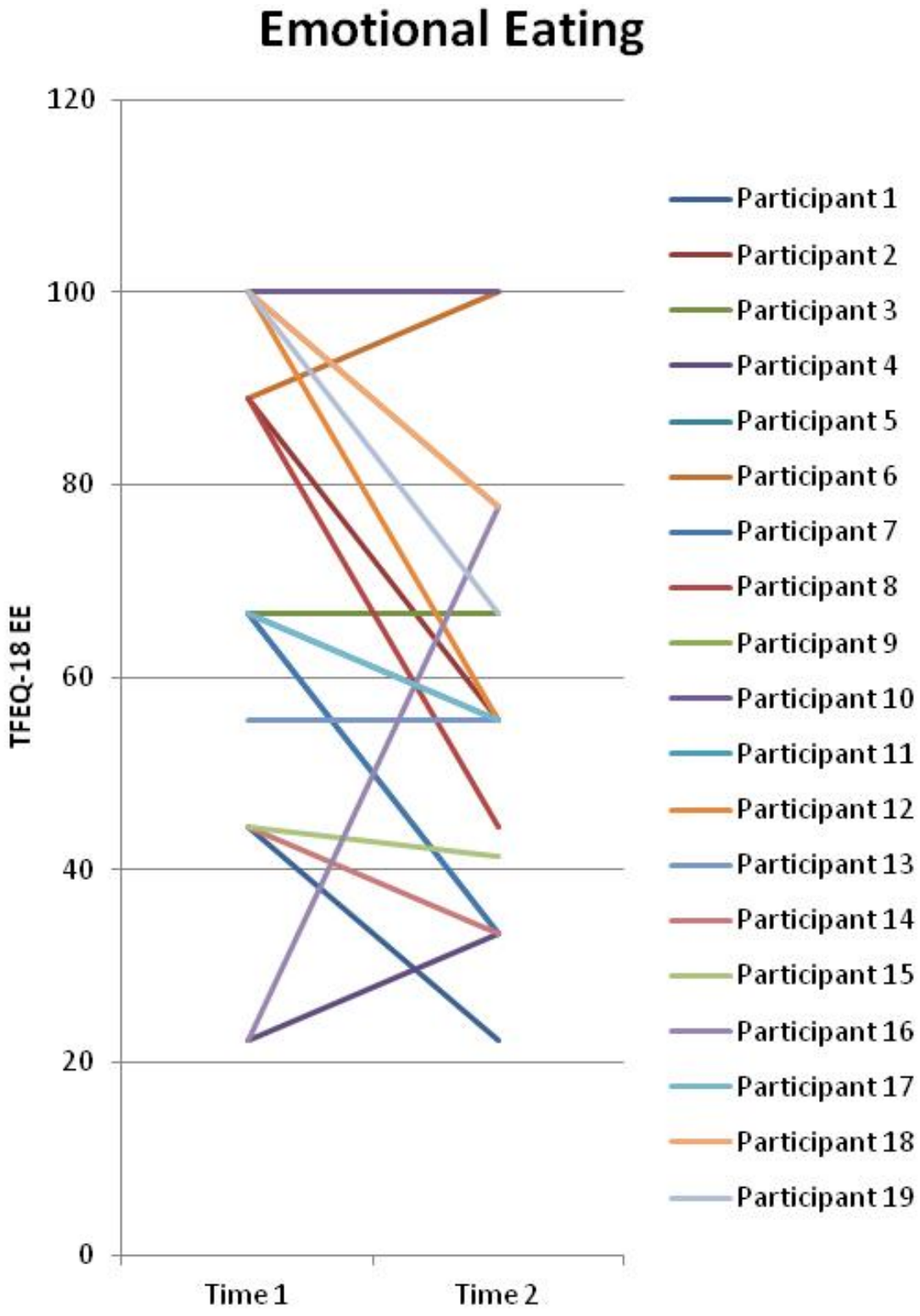


Figure F4. Spaghetti plot for emotional eating by participant.

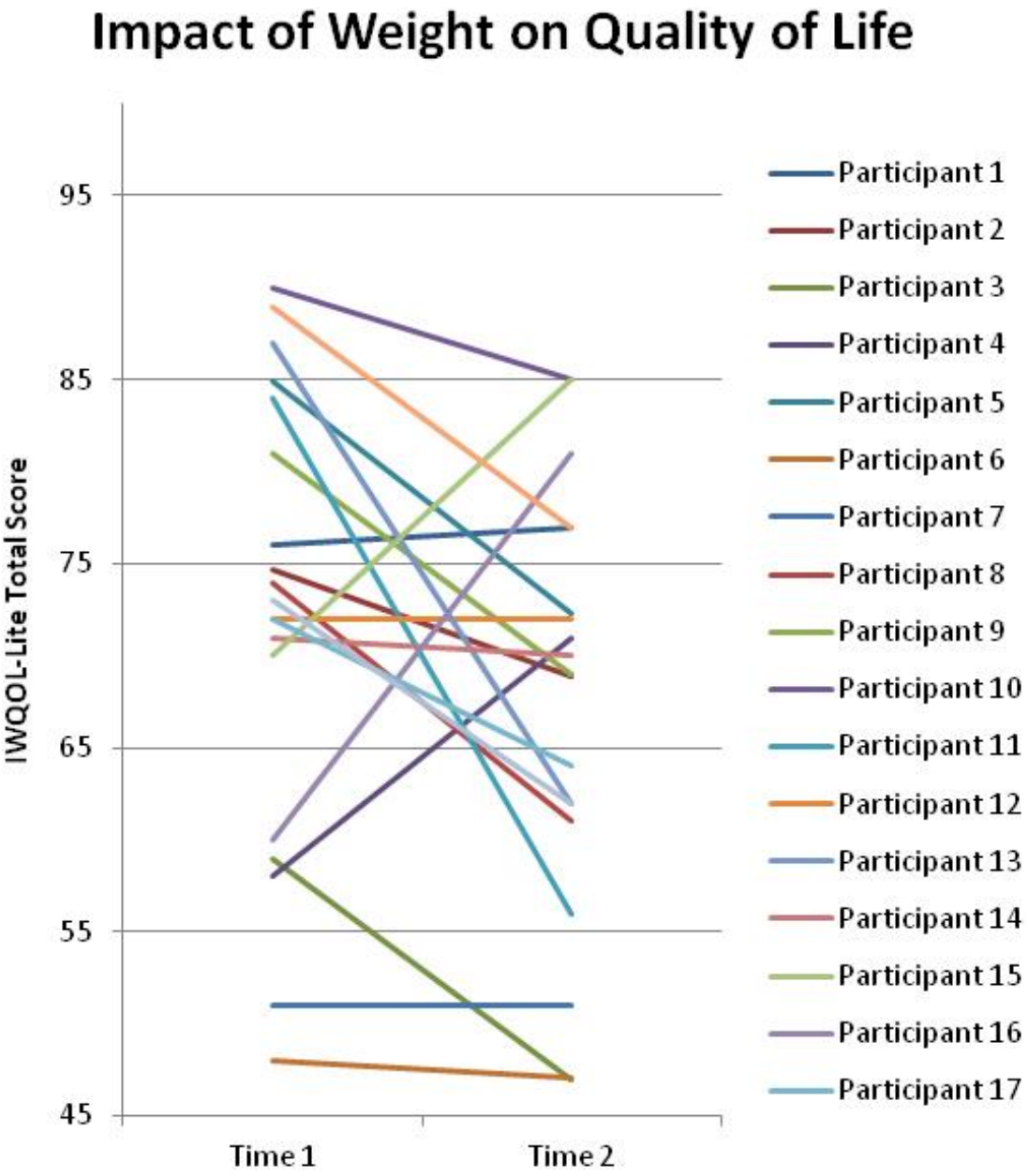


Figure F5. Spaghetti plot for IWQOL-total by participant.

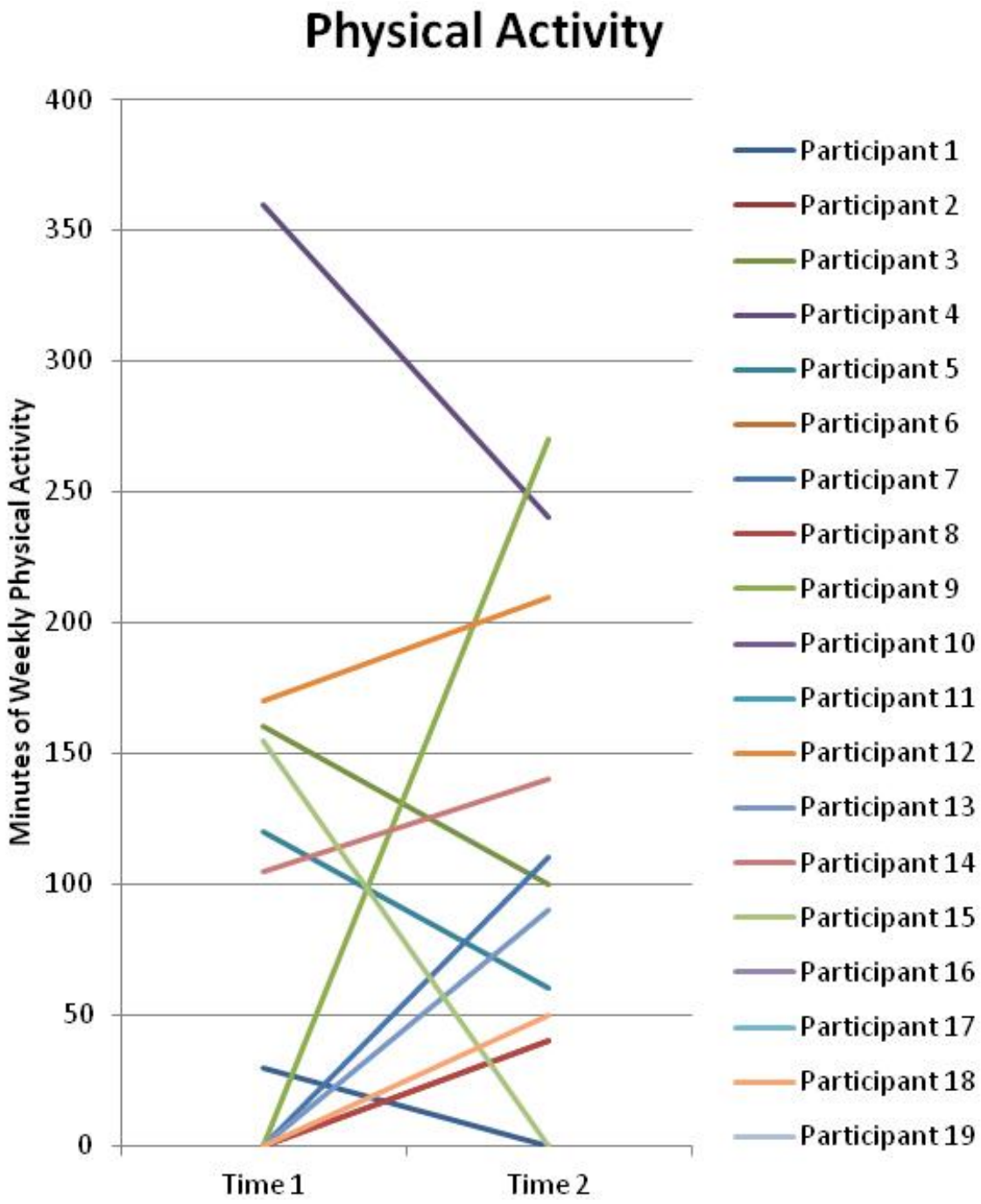


Figure F6. Spaghetti plot for physical activity by participant.

CURRICULUM VITAE

SPENCER MATTHEW RICHARDS

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EDUCATION

Ph.D. 2015	**Utah State University** Clinical/Counseling/School Psychology (APA Accredited) **Dissertation:** Lifestyle intervention in emerging adulthood: A brief acceptance-based behavioral intervention with young adults. **Chair:** M. Scott DeBerard, Ph.D.
M.S. 2011	**Utah State University** Counseling Psychology **Thesis:** Mexican American youths' academic outcomes: The role of ethnic and academic socialization in buffering discrimination. **Chair:** Melanie M. Domenech Rodríguez, Ph.D.
B.A. 2007	**Western Washington University** Psychology *(Cum Laude)* **Emphases**: Clinical/abnormal psychology, multicultural psychology, behavioral neuroscience, Spanish **Advisor**: Deborah Forgays, Ph.D.

AWARDS

2012 Michael Bertoch Memorial Scholarship for Professional Achievement ($1,000)

2012 Psychology Department Research Travel Award ($300), Utah State University

2010 Graduate Student Senate Travel Award ($300), Utah State University

2010 Psychology Department Research Travel Award ($300), Utah State University

2008 Graduate Student Senate Travel Award ($300), Utah State University

2008 Psychology Department Research Travel Award ($300), Utah State University

2008 Psychology Department Tuition Award ($1,795), Utah State University

CLINICAL EXPERIENCE

9/15-9/16 **Postdoctoral Fellow,** Integrated Primary Care Health Psychology
Primary Care Behavioral Health Service
VA Salt Lake City Health Care System
500 Foothill Blvd.
Salt Lake City, UT
Duties: Individual and group psychotherapy, consultation/liaison, pre-surgical evaluation and treatment, geriatric assessment and intervention, interdisciplinary assessment and treatment, supervision of predoctoral interns, home-based primary care, geropsychology.
Director of Training: Caroline Sweeney, Ph.D.

7/14-6/15 **Predoctoral Intern,** Behavioral Health Service Line
Missouri Health Sciences Psychology Consortium
Harry S. Truman Memorial Veterans Hospital
University of Missouri Department of Health Psychology
Columbia, MO
Duties: Brief individual and group psychotherapy (outpatient and inpatient) with evidence-based interventions (e.g., ACT, CBT, MI, CPT, DBT), brief assessment and referral, shared medical appointments, psychoeducation groups in the MOVE! Program, point-of-contact triage consultation, neuropsychological screening, palliative care, long-term psychotherapy, medical floor consultation, other clinical duties as assigned.
Director of Training: Zachary Osborn, Ph.D.

CLINICAL HEALTH EXPERIENCES

7/12-06/14 **Cardiac Rehabilitation Behavioral Consultant,** Advanced Clinical Health
Brigham City Cardiac Wellness, Brigham City, UT
Duties: Brief assessment, facilitation of cardiac rehabilitation treatment fidelity, stress management training, facilitation of patient-provider communication, brief individual psychotherapy, integrated treatment planning with medical professionals.
Supervisor: M. Scott DeBerard, Ph.D.

5/12-5/13 **Behavioral Health Consultant**
USU Student Health and Wellness Center, Logan, UT
Duties: Ongoing treatment for long-term individual therapy clients.
Supervisor: M. Scott DeBerard, Ph.D.

8/11-5/12 **Behavioral Health Consultant,** Practicum in Clinical/Counseling Health Psychology
USU Student Health and Wellness Center, Logan, UT
Duties: Brief individual psychotherapy, brief psychological assessment, consultation with primary care providers, working within an integrated health services model, referral to relevant social services and mental health agencies
Supervisor: M. Scott DeBerard, Ph.D.

6/10-12/10 **Student Therapist,** Practicum in Professional Psychology
Bear River Health Department – Substance Abuse Division, Logan, UT
Duties: Substance abuse/mental health assessment, integrative report writing, individual and group therapy for adults and adolescents.
Supervisors: David Stein, Ph.D., Brock Alder, L.C.S.W.

ADDITIONAL CLINICAL PRACTICA

7/12-5/13 **Practicum Therapist,** Clinical Child Psychology Practicum
Center for Persons with Disabilities, Logan, UT
Duties: Administer comprehensive psychological assessments, psychoeducational assessment, personality assessment, construct integrative psychological reports, provide client feedback coordination of services and treatment facilitation among integrated professional treatment team.
Supervisor: Martin Toohill, Ph.D.

8/10-7/11 **Practicum Therapist,** Practicum in Clinical/Counseling Psychology
USU Counseling and Psychological Services, Logan, UT
Duties: Individual and group psychotherapy for college population, weekly professional development seminars, weight management community consultation, campus and community outreach, psychoeducational workshops.
Supervisors: Mark Nafziger, Ph.D., LuAnn Helms, Ph.D.

8/09-9/10 **Practicum Therapist,** Integrated Practicum in Psychology
USU Psychology Community Clinic, Logan, UT
Duties: Psychoeducational assessment, individual, family, and couples psychotherapy for adults, children, adolescents, and families; behavioral parent training; clinical case presentations.
Supervisors: M. Scott DeBerard, Ph.D., Susan L. Crowley, Ph.D., Kyle M. Hancock, Ph.D., Gretchen Peacock, Ph.D.,

CLINICAL ASSISTANTSHIPS

6/13-6/14 **Graduate Assistant Therapist**
Center for Persons with Disabilities, Logan, UT
Duties: Coordinate and administer comprehensive psychological assessments (developmental, behavioral, psychoeducational, personality, disability); construct multidisciplinary integrative psychological reports; provide client feedback; early childhood intervention; coordination of services and treatment facilitation among integrated professional treatment team.
Supervisor: Martin Toohill, Ph.D.

8/11-5/12 **Graduate Assistant Therapist**
USU Counseling and Psychological Services, Logan, UT
Duties: Individual and group psychotherapy with college population, comprehensive psychoeducational assessment, brief client consultation/referral, behavioral health workshops and outreach, weekly staff training and professional development seminars.
Supervisors: LuAnn Helms, Ph.D., Amy Kleiner, Ph.D., Eri Suzuki, Ph.D., Chris Chapman, Ph.D,

ADDITIONAL CLINICAL WORK EXPERIENCE

3/05-7/08 **Registered Counselor, Residential Aide**
Se>Eye>Chen To>Kw Youth Home
Lummi Indian Nation, Bellingham, WA
Duties: Client intakes; brief substance abuse assessment, individual counseling and group psychoeducation to substance abusing/dependent Native American teens, family communication counseling, community outreach, case management.
Supervisors: S. Matt Magrath, M.S., C.C.D.C III, Linda Duronso, B.A., C.D.P.

RESEARCH EXPERIENCE

PUBLICATIONS

Richards, S.M., Domenech Rodríguez, M. M., Pierce, B.G., Widaman, K., & Conger, R. D. (in press). Mexican American youths' academic outcomes: The role of academic and ethnic socialization in buffering discrimination. *Journal of Community Psychology.*

Richards, S. M., & DeBerard, M. S. (2013). Lifestyle changes. In *The Encyclopedia of Behavioral Medicine*, New York: Springer.

PRESENTATIONS

Richards, S. M., DeBerard, M. S., Wanzek, J., Bluett, E. J., Homan, K. J., & Potts, S. (2015, April). *Lifestyle Intervention in Emerging Adulthood: A Brief Acceptance-Based Behavioral Intervention for Young Adults*. Poster presented at the annual meeting of the Society of Behavioral Medicine, San Antonio, TX.

Wheeler, A., Smith, A., Christiansen, T., **Richards, S. M.,** & DeBerard, M. S. (2012, April). *Using Presurgical Psychological Variables to Predict Compensation and Medical Costs of Radiofrequency Neurotomy Patients Receiving Workers' Compensation.* Poster presented at the annual meeting of the Society of Behavioral Medicine, New Orleans, LA.

Richards, S. M., Domenech Rodríguez, M. M., & Conger, R. (2012, March). *Buffering discrimination: The effects of academic and ethnic socialization on academic and behavioral outcomes in Mexican American families*. Paper presented at the biennial conference of the Society for Research on Adolescence, Vancouver, British Columbia, Canada.

Tafoya, M., Enno, A., **Richards, S. M.,** and Galliher, R.V. (2010, March). *Generational status as a proxy measure of the acculturation of Latino/a youth: Patterns of association with cultural values.* Poster presented at the biennial meeting of the Society for Research of Adolescence, Philadelphia, PA.

Richards, S. M., & Domenech Rodríguez, M.M. (2008, November). *Developmental expectations in a Mexican sample: Relationship to family characteristics and child outcomes.* Poster presented at the biennial meeting of the National Latino/a Psychological Association, Santa Clarita, CA.

POSITIONS

7/13-present **Lead Researcher, Group Leader**
Building Healthy Lifestyles Group, dissertation project, Utah State University
Duties: Assessment; creation, evaluation, and implementation of brief acceptance-based group intervention for overweight and obese young adults.
Supervisor: Scott Deberard, Ph.D.

1/11-1/12 **Clinical Group Leader**
Healthy Sexuality Intervention student dissertation project, Utah State University
Duties: Psychoeducational groups about reproductive health, data collection, peer consultation, pilot data collection.

Supervisor: Brenna Wernersbach, M.S.

8/08-9/09 **Research Assistant**
Latino Family Research Lab, Utah State University
Duties: Data management, data entry and cleaning, statistical operations, weekly supervision meetings, coordination with other lab assistants and professionals.
Supervisor: Melanie Domenech Rodríguez, Ph.D

1/09-5/09 **Research Assistant**
Combined Program Accreditation Self-Study, Utah State University
Duties: Data collection, data entry, data analysis, data management, coordination with other graduate assistant and program faculty, coding and categorization of archival program information.
Supervisor: Susan Crowley, Ph.D

1/06-12/07 **Research Assistant**
Adolescent Research Lab, Western Washington University
Duties: Design culturally-competent community research project, prepare research materials for tribal IRB and approval committees, coordinate research meetings.
Supervisor: Deborah Forgays, Ph.D.

OUTREACH/WORKSHOPS

2014-2015 ***Getting to Work in Psychology,*** invited presenter, one 60-minute webinar
Description: Collaboration with Psi Chi and the American Psychological Association presenting utility of psychology work experience to undergraduate psychology students.

2013-2014 ***Mindful Eating with Diabetes****,* group leader, one 60-minute workshop
Description: Learning to eat mindfully presentation for older adults with diabetes

Values-Driven Weight Loss and Body Acceptance, one 60-minute invited presentation
Description: Presented to Aggie Health participants regarding mindful and values-driven approaches to weight management and body acceptance.

2011-2012 ***Happy and Healthy Workshop***, creator/facilitator, two 90-minute workshops
Description: Acceptance and flexibility in relation to healthy lifestyle choices

Healthy Sexuality Workshop, co-leader, four two-hour sessions
Description: Psychoeducation regarding sexuality, reproductive health, sexual values and communication

Understanding Emotions Workshop, leader, two 90-minute workshops
Description: Emotion regulation skills from dialectical behavior therapy

2010-2011 ***Eating Mindfully Workshop,*** creator, leader, two 90-minute workshops
Description: Psychoeducation regarding weight management skills, mindfulness in eating, developing patterns of values-consistent health behaviors
Utah State University Depression Screen, facilitator, two three-hour outreaches
Description: Brief interviews, referral, and psychoeducation regarding depression for USU students

Utah State University Anxiety Screen, facilitator, two three-hour outreaches
Description: Brief interviews, referral, and psychoeducation regarding anxiety and related disorders for USU students

2008-2009 ***Sexuality and Values-Driven Parenting for Latina/o Couples***, three-hour workshop
Description: Lead discussion with Spanish-speaking couples and men regarding parenting, sexuality, communication, and intimacy
St. Thomas Aquinas Catholic Church, Hyde Park, Utah

TEACHING EXPERIENCE

2012-2013 **Introduction to Psychology,** Psychology 1010
Solo instructor, interactive broadcast
Utah State University, Logan, Utah

Physiological Psychology, Psychology 3460
Graduate Teaching Assistant, on-campus section
Utah State University, Logan, Utah

Abnormal Psychology, Psychology 3210
Graduate Teaching Assistant, on-campus section
Utah State University, Logan, Utah

2011-2012 **Introduction to Psychology,** Psychology 1010
Solo instructor, taught via interactive broadcast
Utah State University, Logan, Utah

2010-2011 **Introduction to Psychology,** Psychology 1010
Solo instructor, two sections via interactive broadcast and in-person
Utah State University and Bridgerland Applied Technical College, Logan, Utah

Psychological Statistics, Psychology 2800
Solo instructor, two sections online and in-person
Utah State University, Logan, Utah

2009-2010 **Psychological Statistics,** Psychology 2800
Solo instructor, online section
Utah State University, Logan, Utah

Psychological Statistics, Psychology 2800
Graduate Teaching Assistant, four classes in on-campus and online sections
Utah State University, Logan, Utah

2008-2009 **Introduction to Counseling,** Psychology 5200
Graduate Teaching Assistant, on-campus section
Utah State University, Logan, Utah

SPECIALTY TRAININGS ATTENDED

9/2014 Military Sexual Trauma in Male Veterans
2-hour workshop
Ashley Smith, Ph.D. (Veterans' Health Administration)
Harry S Truman Memorial Veterans' Hospital, Columbia, Missouri

2/2012 Brief Cognitive Behavioral Therapy for Suicidal Soldiers
8-hour workshop
Craig J. Brian, PsyD, ABPP (University of Utah)
University of Utah/National Center for Veterans Studies, Salt Lake City, Utah

4/2011 Motivational Interviewing in Treating Problem Drinking
8-hour workshop
Jason Kilmer, Ph.D. (University of Washington)
Utah State University, Logan, Utah

4/2010 An Integrated Approach to Complex Psychological Trauma
8-hour workshop
John Briere, Ph.D. (University of Southern California)
Utah State University, Logan, Utah

4/2009 Using Motivational Interviewing and Behavior Change
2-hour workshop
Jason Burrow-Sanchez, Ph.D. & Megan Call, M.S.
Utah State University, Logan, UT

1/2009 Professional Ethics Workshop
8-hour workshop
Stephen Behkne, J.D., Ph.D. (Director of APA Ethics Office)
Utah State University, Logan, Utah

10/2008 Acceptance and Commitment Therapy Multicultural Training
6-hour workshop
Michael P. Twohig, Ph.D., & Melanie M. Domenech Rodríguez, Ph.D. (Utah State University)
Utah State University, Logan, Utah

PROFESSIONAL SERVICE

POSITIONS

7/14-6/15 **Missouri Health Sciences Psychology Consortium Diversity Committee Student Representative**
Harry S Truman Memorial Veterans Hospital
Duties: Develop and coordinate quarterly diversity training workshop, serve on monthly diversity steering committee, facilitate recruitment of interns

6/11 – 5/12 **USU Combined Clinical/Counseling/School Psychology Student Representative**
Utah State University
Duties: Liaison to psychology department faculty, plan/facilitate monthly student meetings, coordinate monthly didactic presentations, coordinate prospective student interviews.

9/10-5/11 **Psychology Graduate Support Group Founding Committee Member**
Utah State University
Duties: Establish and facilitate bi-weekly 90-minute support group for psychology department graduate students, present on mindful eating and assorted behavioral health topics, behavioral commitment to wellness values, and self-care.

MEMBERSHIPS

2012-present **LGBTQ-Affirmative Psychotherapists Guild of Utah,** student member

2011-present **Society for Behavioral Medicine**, graduate student member
Obesity and Eating Disorders Special Interest Group, member
Ethnic Minority and Multicultural Health Special Interest Group, member
Multiple Health Behavior Change Special Interest Group, member
Physical Activity Special Interest Group, member

2011-present **American Group Psychotherapy Association,** graduate student member

2010-present **APA Division 38: Health Psychology,** graduate student member

2010-present **Association for Contextual Behavioral Science**, graduate student member
Contextual Medicine Special Interest Group, member

2010-present **Utah Psychological Association**, graduate student member

2009-2012 **Society for Research on Adolescence**, graduate student member

2009-present **APA Division 12: Clinical Psychology,** graduate student member

2008-present **American Psychological Association**, graduate student affiliate member

2008-present **American Psychological Association of Graduate Students,** member