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Healthy Weight Maintenance: Narrative Analysis of Weight Cycling in the Formerly Obese

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2016

Abstract

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by

Cheri R. Lewis

MS, Eastern Washington University 2004

BS, Eastern Washington University 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Medical and economic costs for obesity are estimated at $147 billion per year, yet less than 1/3 of overweight individuals successfully maintain weight loss. The literature is replete with descriptions of the problem and research on treatments, yet demonstrations of effective loss and maintenance are lacking. Missing is an understanding of the experiences of individuals who successfully maintained healthy weight loss, which could provide insights regarding effective psycho-social interventions. The purpose of this qualitative narrative study was to explore key events and experiences in the lives of former weight cyclers. The primary phenomena of interest included weight cycling and sustained weight loss. Self-determination theory (SDT) and social cognitive theory (SCT) provided the theoretical frameworks to explore concepts like autonomy, mastery, and vicarious learning, which are known to be associated with recovery from other addictions (e.g., smoking cessation, weight loss). Using the tradition of narrative analysis, the stories of 6 formerly obese weight cyclers revealed 5 major themes: structure, strategies, relationship/support, autonomy, and identity as a fat person. Findings support SDT and SCT as meaningful frameworks for understanding how severely obese individuals can attain successful weight maintenance. Findings from this study revealed elements not fully addressed by these theories, such as resilience, the diverse orientations to the problem, and overarching themes common to all participants. Findings can be used to place greater emphasis on psychological components such as autonomy, mastery, and relatedness, which are necessary for successful remission. Findings may contribute to reducing direct and related costs of obesity and improving quality of life for individuals and their families.

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Dedication

I would like to dedicate this work to my children, Stacia and Jeremy. They have supported and inspired me to continue, no matter what challenges came our way on this journey. I would also like to acknowledge the role Dorothy, Ray, and "Ma" played in my passion for seeking answers to the modern challenges of achieving and maintaining good health. Less than a century ago, we worried that illness or injury would shorten a loved one's life. We now have different threats to a long and healthy life. I do not believe that my dedication to this endeavor would have been sustained without the influence of these five very special people.

To Stacia and Jeremy, my hope is that you are able to make the best possible choices to attain a long and healthy life.

Acknowledgements

I would like to take this opportunity to acknowledge the support, patience, and encouragement of my chair, Dr. Susan Marcus and my committee members, Dr. Medha Talpade and Dr. Lynde Paul. My sister, Michelle Braley, stepped up to provide office management of my practice when I needed her, making it possible for me to give this work the focus and attention it required. I cannot acknowledge my children enough through this process. They have willingly embraced this process, demonstrating wisdom beyond their years.

I am very grateful to the participants who willingly shared their time and their stories with me. I would also like to thank everyone who made referrals or an effort to make referrals to this study.

I would also like to acknowledge those individuals who helped me when technical challenges required more than an online tutorial to resolve.

I would like to acknowledge Vertex42.com for providing permission to use the Body Mass Index Chart.

Finally, I would like to acknowledge Mike N. whose support and encouragement arrived “just in time.”

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Chapter 1: Introduction to the Study

Obesity, weight loss, and sustained weight loss are the three sides of a multifaceted condition, affected by nutrition, activity level, coping and social skills, education, and cultural contexts. Obesity and weight loss are also influenced by genetics and biochemical processes in the brain, organs, and tissues that manifest as physiological and psychological problems. In spite of the enormous body of literature on causes of and interventions for obesity, little is known about how sustained weight maintenance can be achieved. Therefore, the purpose of this narrative study was to understand the experiences and events that allowed formerly obese weight cyclers to sustain a healthier weight. Chapter 1 presents the background, purpose, research questions, theoretical framework, nature of the study, definitions of terms, assumptions, limitations, scope and delimitations, and significance of the study as well as implications for social change.

Background

The prevalence of obesity in U.S. adults is of significant concern (Echols, 2010). Medical and economic costs for obesity are estimated at $147 billion per year (Finkelstein, Strombotne, & Popkin, 2010). Although weight loss programs have flourished in the United States, on average less than one third of overweight individuals have successfully maintained weight loss (Kruger, Blanck, & Gillespie, 2006). In an effort to find effective treatment, medical researchers have explored the biochemistry of obesity and weight loss. However, there is a need to explore the narratives of individuals who have sustained a healthier weight after a history of weight cycling. Their stories could provide insight into developing and evaluating effective psychosocial interventions

to augment weight loss programs and provide inspiration to individuals who struggle with weight cycling.

The results of this study could offer insights to clinicians and laypersons regarding the social-psychological experiences that help individuals who struggle with weight cycling. These insights could be incorporated as recommendations and guidelines for treatment plans. The stories can be offered as examples to inspire and provide assurance that change is possible.

When I examined the research literature relevant to this study, I identified emotional, physical (health), and financial costs associated with obesity. Interventions were often designed around specific barriers such as depression, anxiety, and metabolic dysfunction. Lifestyle has been increasingly addressed, with an emphasis on nutrition, exercise, and stress management (Angermayr, Melchart, & Linde, 2010). Despite a systematic review of the literature involving 25 trials and a total of 7,703 participants, Angermayr et al. (2010) concluded that there was a lack of evidence identifying a multifactorial approach as the most effective for weight loss.

The media and published literature has generated many thousands of anecdotal articles and testimonials about the challenges of weight loss and weight maintenance (Skloot, 2007). Unfortunately, scientific research identifying successful long-term weight loss maintenance was lacking at the time of this study. Most researchers measured

efficacy of immediate interventions, with follow-up studies usually 6 months to 2 years after the completion of the intervention. Medical procedures such as Roux-En-Y and gastric sleeve have been the exception. However, surgical intervention has not been appropriate and/or available to a large percentage of morbidly obese weight cyclers.

I sought to address this gap in the scientific literature by exploring narratives of individuals who have sustained successful weight loss after recurring cycles of loss and gain, indicating the capacity of the individual to identify and overcome historically problematic behaviors or conditions. The study was needed to clarify the turning point from weight loss and regain to healthy weight maintenance.

Problem Statement

Numerous studies have been done on short-term weight loss through lifestyle modification, but little research has been done on long-term success. Despite decades of investigations, health care and research professionals have yet to find efficacious and sustainable treatment plans for chronic weight cyclers (Cogan & Rothblum, 1992; Elfhag & Rössner, 2005; Flegal, Carroll, Ogden, & Curtin, 2010). Most of the researchers focused on the neurochemistry of weight gain and loss in an effort to find a medical intervention to treat obesity and weight cycling. There were also studies on the effectiveness of lifestyle change programs (Cogan & Rothblum, 1992; Powell, Calvin, & Calvin, 2007; Pratt et al., 2009). However, what was missing was an exploration of the experiences of individuals who successfully lost weight and maintained weight loss.

Insight into what it takes to avoid the pitfalls of weight cycling could inform future research and treatment.

Purpose of the Study

The purpose of this qualitative study was to explore key events and experiences in the lives of former weight cyclers who maintained significant weight loss for at least 2 years after multiple attempts. A narrative analysis was conducted to capture the life stories and key moments that contributed to and challenged participants' ultimate success. Narrative analysis was used to identify emerging themes regarding the barriers to weight loss and the experience of weight maintenance.

Research Question

The central research question of this study was the following: What do the narratives of the formerly obese reveal about weight cycling and healthy weight maintenance? The following sub-questions were also addressed:

- How does the narrative start?
- What are the turning points in the journey?
- What is the meaning of repeated efforts?
- How is the self or identity described?
- What are the meaningful sources of support?
- What is the present moment of the narrative?

Theoretical Frameworks

SDT has frequently been used to understand the mechanisms of lifestyle choices and change (Miquelon & Vallerand, cited in Deci & Ryan, 2008; Williams, Grow, Freedman, Ryan, & Deci, 1996). SCT has been applied to disease management and lifestyle change (Bandura, 2008). Concepts from both theories were used as the conceptual framework to guide the development of the data collection tools and analysis plan.

Deci and Ryan (2002) developed SDT and its five components based on experiments conducted as early as 1971 on intrinsic and extrinsic motivation. The theory was used to explain the difference between intrinsically and extrinsically motivated behaviors. The five components include cognitive evaluation theory, causality orientations theory, organismic integration theory, basic psychological needs theory, and goal contents theory.

Cognitive evaluation theory is used to explore how rewards, social relationships, and identity affect intrinsic motivation and preferences. Organismic integration theory is used to explore the ways in which extrinsic motivation is internalized. Causality orientations theory is used to explain differences among individuals' preferred types of motivations. Three types of orientations are identified in this subtheory. Autonomy orientation refers to motivation to pursue an action for the pleasure or valuing of the action rather than a secondary reward for doing so. Control orientation refers to acting to

receive rewards or approval. Amotivated orientation refers to a lack of confidence in competence.

Basic psychological needs theory is used to examine the effects of support (or lack of it) on psychological needs. The needs for autonomy, competency, and relatedness must be supported to promote psychological health, and the absence or opposition to meeting these needs adequately results in maladjustment. The last subtheory, goal contents theory, is used to examine the impact of intrinsic and extrinsic goals on psychological well-being. Goal contents theory indicates that intrinsic goals such as community, relationships, and personal growth lead to greater overall well-being than the pursuit of extrinsic goals such as money, beauty, or fame.

As a social-cognitive theory addressing incentives within a social context, SDT indicates that intrinsic motivational focus may have a substantial impact on the success of health behavior outcomes (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). SDT is used to describe intrinsic motivation (intrinsic aspirations) as goals associated with affiliation, generativity, and personal development. Extrinsic motivation (extrinsic aspirations) are those associated with fame, wealth, and attractiveness. SDT states that extrinsic aspirations are the result of thwarting to some degree basic emotional needs (Deci & Ryan, 2008). Considered a macro theory of behavior change, SDT has been used to explain successful outcomes in smoking cessation (Deci & Ryan, 2008) and other

health decisions, including sustained weight loss (Deci & Ryan, 2008; Williams, et al., 1996).

SCT has also been used to explain positive change relevant to health behaviors (Dewar, Lubans, Plotnikoff & Morgan, 2012; Tavares, Plotnikoff, & Loucaides, 2009). SCT was originally developed in 1941 by Miller and Dollard to explain that learning occurs through the observation of others, and was expanded by Bandura (Bandura, Ross, & Ross, 1961) to incorporate related concepts of identification, vicarious learning, and self-efficacy. SCT is used to explain human behavior from a foundation of self-efficacy, the degree to which one believes that one can effect change through his or her own efforts (Bandura, 2004). SCT states that both short- and long-term goals are impacted by barriers and/or facilitators in the environment (Bandura, 2004). For example, a constant barrage of messages norming the consumption of unhealthy foods can create a barrier to a healthy lifestyle. Participation in an organization promoting physical fitness (e.g., biking club, dance group, recreational sports team) could facilitate healthy habits.

Perceived pleasure or discomfort associated with the behavior necessary to achieve goals as well as expectations of material loss or gain play a role in outcome expectations (Bandura, 2004). An individual on the path to healthier choices may ask himself or herself, “Is it worth all the effort and money if I’m just going to gain all the weight again?” Social acceptance or rejection also informs behavioral choices (Bandura, 2004). Cultural forces around eating and exercise habits vary greatly. It may seem rude to

refuse dessert or ask for an alternative entrée. Making time for exercise or sports may seem selfish to certain family members, resulting in barriers to engagement of essential health behaviors. The behavior's congruence or dissonance with identity and values are yet another variable in the mix (Bandura, 2004). If the participant self-identifies as "fat" or "not really an exercise person," engaging in behaviors to make them "un-fat" may be too uncomfortable to maintain, or they may simply revert to behaviors that keep them stuck in a cycle of unhealthy behaviors.

Nature of the Study

A narrative design was chosen as the qualitative approach for the study because there was a dearth of research addressing the complex phenomenon of sustained weight loss in formerly obese weight cyclers. Narrative analysis provided new insights into the process of change among this population. Furthermore, because weight cycling is a temporal phenomenon (i.e., the person experiences aspects of this phenomenon over time), narrative analysis was used to capture life experiences and explore recurring themes within and across participants' lives over time.

Key concepts such as weight cycling and healthy weight maintenance have been inconsistently defined in the research (Stevens, Truesdale, McClain, & Cai, 2006). Obesity has been defined by the Centers for Disease Control (CDC, 2012) as a Body Mass Index (BMI) ≥ 30. Obesity can also be conceptualized as a chronic condition (based on reported efficacy of weight loss attempts) that, without effective treatment, will return.

Therefore, the target population was defined as men and women who were obese, and who had engaged in effective health-enhancing behaviors and strategies to maintain their weight loss for at least 2 years. For this study, weight cycling was generally defined as losing and regaining at least 20% of one's body weight at least two times.

Data were collected by interviews with selected participants who responded to an invitation to participate or were referred by participants, friends, or colleagues. To reach a broad range of individuals, invitations were posted on a Facebook page, professional website, and Walden participant pool. Additionally, hard copy invitations were posted in areas promoting examples of successful weight loss stories (such as fitness clubs). Snowball sampling (asking invitees and participants to forward the invitation to others) was also used.

Once participants responded and were screened for inclusion criteria, they were sent a consent form. I met with them at a mutually agreeable location if geographically possible, or conducted a phone or Skype interview based on their preference if they were more than 90 minutes away by car travel.

Atlas/ti 7 was used to organize the data to identify themes and discrepant cases. Participants were provided an opportunity to review my summary within 3 weeks of the interview to provide corrections, if necessary. Participants agreed at the time of the interview to clarify any inaccuracies in the summary via phone or email. Themes were developed using Riessman's (2008) thematic analysis approach, and five themes were

identified. These included structure, strategies (for maintaining food and exercise, and for maintaining honesty with self), relationship as support, autonomy/partnership of the program, and identity as a fat person. The results of this study were examined in relationship to the theoretical frameworks and published research. Implications for future research and clinical directions are presented in Chapter 5.

Definition of Terms

Gliosis: a proliferation of astrocytes in damaged areas of the central nervous system (CNS) after an injury to the brain or spinal cord (Taber, 2009).

Interleukins: a type of cytokine that enables communication among leukocytes and other cells active in inflammation or the specific immune response. The result is a minimized response to a microorganism or other foreign antigen (Taber, 2009).

Leptin: a helical peptide hormone produced by adipose tissue. Leptin acts on cells in the hypothalamus in response to increases in body fat storage to suppress appetite and increase energy expenditure (Taber, 2009). It also effects cardiac and vascular actions (Abd El-Aziz, Mohamed, Mohamed, & Pasha, 2012).

Melanocortin: a peptide hormone that plays a role in weight as evidenced by resulting hyperphagia and obesity when mutations in the pro-opiomelanocortin (POMC) gene, or in the melanocortin MC (4) receptor gene, or in the agouti locus occur. Recent studies indicate an interaction between melanocortins and both leptin and neuropeptide Y (Vergoni & Bertolini, 2000).

Neurotrophins: A family of proteins that affect other nerves in their ability to protect, promote growth and development such as differentiation, survival, neurite outgrowth, synaptic formation, and plasticity (Vetrivel et al., 2012).

Pathogen: the ability to produce a disease (Taber, 2009).

Psychasthenia: a condition consisting of obsessions, phobias, morbid impulses, morbid states of excitement and distress, mental manias, tics, depersonalization and/or disassociation (Gardiner, 1904).

Psychosocial: involving both psychological and social aspects (Cleland, Ball, & Crawford, 2013).

Reversal theory: a theory organized around four pairs of opposing psychological states, explaining behavior as reversals between pairs of psychological, emotional, and motivational states (Apter, cited in Sit & Lindner, 2006).

Self-efficacy: a basic principle correlating degree of engagement in activities with belief in personal competency. The greater the self-perceived competency in an activity, the more likely individuals will be to attempt the behavior (Bandura, 1977; Gao et al., 2013).

Thermogenesis: the production of heat. When ingesting food, it refers to the heat-producing response to the digestion absorption and breakdown of consumed foods, and the synthesis and storage of proteins and fats. The calories used in the thermic response are expended and therefore not stored as fat (Taber, 2009).

Ventromedial hypothalamic: Part of the brain associated with feeding, fear, thermoregulation, and sexual activity are affected by the VMH, which is located in the hypothalamus (Kurrasch & Cheung, 2007).

Weight loss maintenance: Sustained volitional weight loss of at least 2 years (Cheskin, 2008).

Assumptions

I assumed that, as a result of multiple successful attempts at weight loss, participants were knowledgeable about reasonably healthy practices to manage weight. I also assumed that participants would be able to recall relevant events in their weight loss journey to provide insight into this treatment resistant condition. The lack of empirical research available on this issue placed participants in the role of experts with the hope that the reporting of their experiences would provide relevant information to influence some improvement in the treatment of chronic weight cycling.

Based on observations in my practice, I also assumed that participants would treat physical health as a higher priority compared to the prevailing culture, which at the time of the interviews was composed of approximately one-third normal weight and two-thirds overweight or obese adults (CDC, 2012). I assumed that participation in a community composed of health conscious individuals such as family, friends, organized groups such as Overeaters Anonymous (OA), or sports related would be perceived by participants as beneficial to sustained weight loss. Due to my exposure via my practice and the literature

to weight loss practices, my ability to identify discrepant themes may have been hindered. I needed to be vigilant to identify unexpected tools or behaviors participants may have used to maintain weight loss.

Limitations

Transferability is the ability of the reader to apply the study findings to other settings (Lincoln & Guba, 1985). I used the technique of rich, thick descriptions to provide sufficient information about the role of the researcher, context, participants, data gathering and analysis process, results, and interpretation. It is hoped that this level of detail will facilitate the reader's identification of commonalities across similar and dissimilar contexts and individuals (Morrow, 2005).

Difficulties with recruitment are presented in Chapter 4. Though the goal for this study was to interview 12-16 participants, recruiting efforts over the course of 4 months at the local level (a metropolitan setting) and using social media (Walden participant pool and professional Web sites) resulted in only six participants.

It is unknown if my professional role as therapist with a subspecialty in treating chronic illness including chronic weight cycling influenced potential participants to reach out for study participation. This information is accessible via my online presence as a private practitioner.

Narrative analysis is used in the examination of two stories: one told by the participant and one told by the researcher (Reissman, 2008). This creates risk for

researcher bias, as the researcher is acting both as observer and observer participant. As an observer, I attempted to gather data without bias or influence. Being a participant observer is unique to narrative in that the researcher is influencing participants via responsiveness (verbal and nonverbal) to the participants' stories, as well as interpretation of the story (Reissman, 2008).

To reduce the likelihood of the researcher asking leading or inappropriate questions, the open ended interview questions are reviewed by qualitative methodological experts (Creswell, 2007). To prevent distortions of data, I recorded the interviews, and transcribed them word-for-word. Audit trails, rich thick descriptions of the research process, and member checking (the process of inviting participants to assess the researcher's summary and interpretation of the transcript) were used to increase trustworthiness (Carlson, 2010; Zhang & Wildemuth, 2009).

Reissman (2008) recommended using the framework of the specific discipline guiding the study to bracket the concept. Reissman addressed the challenge of linking theory to the story as told by the participant and then again as told by the researcher. To maintain the link between theory and evidence, Reissman (2008) encouraged the researcher to use explicit modes of inquiry to illustrate the link. In this study, the researcher presented the interview questions and direct quotes as evidence, knowing that "narrative truths are always partially committed and incomplete" (Reissman, 2008, p. 186). Further, providing a detailed history of the research process, identifying the

evolution of theme identification and analysis, and describing difficulties experienced along the way serves to illuminate any tendencies toward researcher bias (Creswell, 2007).

Four of the six participants were related. Though family members expressed a desire to be open and share their stories for the benefit of others, it is unknown if concerns regarding confidentiality informed or influenced participants' responses. This is addressed in greater detail in Chapter 3.

Scope and Delimitations

The scope of the study was chosen because the research in obesity and weight loss is predominately focused on the interventions, rather than the longer term efforts these individuals make to sustain their reduced weight. The study was limited to weight cyclers over the age of 18 who had lost and gained at least 20% of their weight two or more times. Weight cyclers losing and gaining smaller amounts of weight were excluded to maximize potential for transferability. Participants struggling with active addictions or active eating disorders were excluded. The health belief model, often used to understand and explore medical conditions, was not used because the issues identified in this study are too varied and complex to be adequately addressed by this model. (Keatley, Clarke, & Hagger, 2012).Though referenced in the study, reversal theory was not used to understand or explain the phenomenon of sustained weight loss in former weight cyclers.

Reversal theory is helpful in understanding aspects of the experience, but it may be too abstract to explain the nuances of this condition.

Significance of the Study

Obesity has significant impact on the lives of individuals, families, communities, the United States. Millions of dollars are invested in private and public sector weight loss programs with marginal success (Cogan & Rothblum, 1992; Columbi & Wood, 2011; Powell et al., 2007; Tsai & Wadden, 2005), Furthermore, millions are spent on treating the short- and long-term health consequences of obesity (CDC, 2012; Columbi & Wood, 2011; Powell et al., 2007). Government studies have identified obesity at epidemic proportions (CDC, 2012; Flegal et al., 2010). Efforts to mitigate the problem and offer hope to obese individuals represent a significant contribution to positive social change.

As additional information emerges identifying relevant interventions, policymakers will be better equipped to develop effective programs and policies. That is, when recurring themes are discovered (specific to the array of barriers), policymakers will have a better foundation of knowledge upon which to educate community stakeholders and government organizations within the CDC such as the Department of Nutrition, Physical Activity, and Obesity (DNPAO). The DNPAO works at the national and state level to promote healthier environments and healthier choices in work, restaurant, school, and child care settings (CDC, 2012).

The current approaches lack efficacy as evidenced by relapse rates and the overall obesity rate. Identifying relevant forces, events, attitudes, and personally meaningful interventions provides a foundation upon which to create policies supporting successful outcomes.

The narratives of individuals who have experienced this phenomenon can provide insights into effective strategies to manage and overcome chronic weight cycling. The results of the study may contribute to the development of interventions practitioners can use to guide clients. Connecting through stories with others who have struggled and overcome obstacles may also provide hope and inspiration to individuals striving for better health outcomes.

Implications for Social Change

The results of this study may generate positive social change at the individual and societal level. Increasing the body of research describing relevant experiences that produce sustainable change for chronic weight cyclers may result in improved quality of life for individuals and reduced financial strain on the United States. The information gained may enhance prevention programs.

The data provided by this study contributes to a body of knowledge largely quantitative and norm based. A plethora of studies regarding obesity and weight reduction exist in the literature, but the problem of obesity and its often multidimensional etiology confounds many intervention-based studies.

Improving the understanding and treatment may lead to better health, better quality of life, and less stigma for a large subset of the U.S. population. The potential for more effective approaches to sustained weight loss could free resources currently devoted to correcting a troubling problem. The opportunity to effect social change at the local level includes relaying information to health care providers and to individuals struggling with chronic weight cycling. I will endeavor to make presentations at local professional conferences, and develop training materials and tools to publish on my website. I will also make presentations to local organizations such as Overeaters Anonymous and other self-described groups interested in chronic weight cycling, which can provide opportunities to individuals who want to lose weight and maintain weight loss.

Summary

Obesity creates physical limitations and is associated with higher rates of illness, lower quality of life, and shorter life spans. Although efforts to lose weight may be successful, research demonstrating sustained long-term weight loss is lacking. Exploring the stories of individuals who have sustained long-term weight loss ($\geq$ 2 years) may lead to more effective approaches in the treatment of obesity. The purpose of this narrative study was to understand the experiences and key events that allowed former weight cyclers to sustain healthier weight over the long term. Weight cycling was defined as losing and regaining at least 20% of one's body weight at least two times.

Chapter 2 presents the database search terms utilized from the literature review, definitions of obesity, weight cycling and weight maintenance. The emergence of obesity as a national health issue, biochemistry of obesity and weight loss, physiological forces, psycho-bio chemistry (monoamines, depression and initiative), psychological traits, co-occurring mental illness, abuse/trauma, the social psychology of obesity and weight loss, lifestyle, weight loss programs, (behavior modification, pharmaceutical, proprietary/surgical/commercial weight loss programs), the phenomena of weight cycling, and sustained healthy weight maintenance.

Chapter 2: Literature Review

The purpose of the narrative study was to understand the experiences and events that allowed formerly obese weight cyclers to sustain a healthier weight. The focus of the literature review was on the phenomena of obesity, weight loss, and sustained weight loss, which are the three sides of a multifaceted condition affected by nutrition, activity level, coping and social skills, education, and cultural contexts. Obesity and weight loss are also influenced by genetics and biochemical processes in the brain, organs, and tissues that manifest as physiological and psychological problems.

The incidence of weight problems and obesity has grown dramatically, particularly in wealthier countries such as the United States. Obesity mortality and remission rates are not reported despite decades of research in the public and private sectors. In contrast, cancer mortality was reduced 1.1% per year between 1975 and 2004 (Jemal et al., 2004).

Chapter 2 provides a review the relevant literature and presents database search terms used for the review. The theoretical framework of SDT and SCT is also explained.

Database Search Terms

I searched peer-reviewed journals electronically using medical and psychological databases such as MedLine, Cinahl, SOCIndex, PsychARTICLES, and Academic Premier. I also used a medical text addressing the relationship between obesity and mental illness (Mendelson, 2008) and government sponsored sites such as the CDC. I

reviewed 125 articles, most published between 1988 and 2013, and 14 books published between 1957 and 2008. Key search terms (with the number of articles in parenthesis) included the following: *weight cycling and immunocompetence* (4), *overeating, obesity, and/or BMI* (7), *reversal theory and weight cycling* (3), *weight regain and obesity* (6), *metabolic syndrome* (1), *obesity and trauma or mental illness* (12), *psychology of weight loss* (17), *social psychology of weight loss* (10), *social psychology of weight and stigma* (4), *successful weight maintenance* (5), *hypothalamic neural injury* (9), *bariatric surgery* (5), *efficacy and Weight Watchers* (1), *efficacy and weight loss programs or interventions* (16), *weight loss efficacy and diets* (1), *psychotropic drugs and obesity* (15), *qualitative research methods* (5), and *prevalence of obesity* (4). In addition to the articles, six books were reviewed: metabolic syndrome and mental illness (1), qualitative research (4), and Taber's medical dictionary.

Defining Obesity, Weight Loss, and Weight Maintenance

Obesity

Obesity is defined as having a BMI of 30 or higher, and overweight is defined as having a BMI of 25.0 to 29.9 for individuals 18 or older (CDC, 2012). Body mass index is calculated by dividing a person's weight by their height squared by 703. A 150 lbs (68.04 kg). normal sized woman who is 66" (167.64 cm) tall, would have a BMI of 24.18. An obese woman (BMI = 35) of the same height would weigh approximately 216 (97.98 kg) lbs.

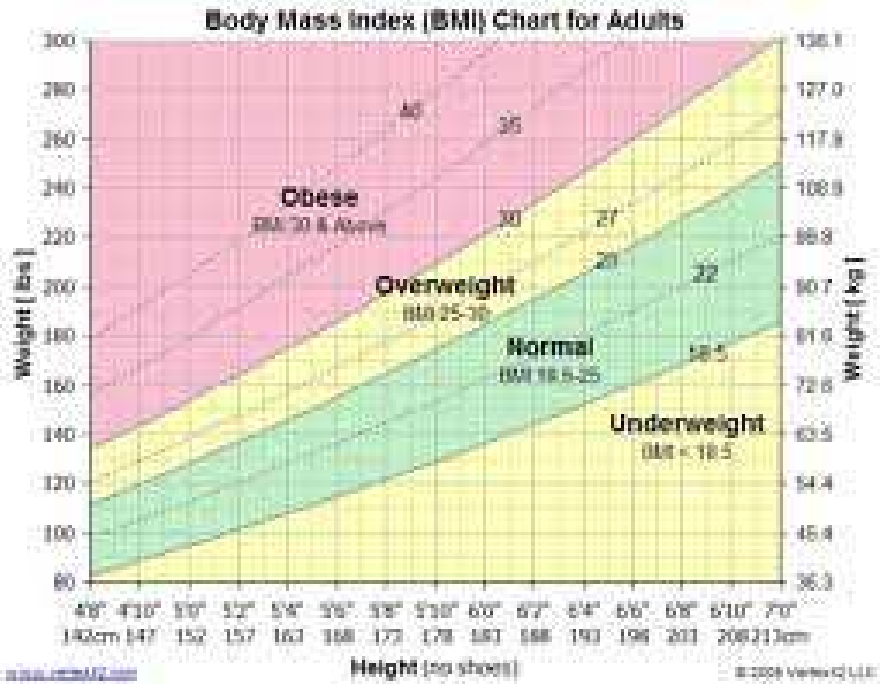

Figure 1. Body mass index chart for adults. BMI chart created by *Vertex42.com*. Used with permission.

In Figure 1, the y-axis indicates weight, and the x-axis indicates height. Yellow sections represent under or overweight, the green section represents the normal range, and the pink section represents the obese range.

This definition of obesity has emerged as research and treatment of obesity has become more prevalent over the past 100 years (Eknoyan, 2008). The insurance industry led the movement to track obesity-related illness and mortality in the early 20th century (Eknoyan, 2008). Metropolitan Life Insurance categorized individuals by frame (small, medium, or large) and determined risk based on their relationship to an identified normal (healthy) weight associated with that frame. Undesirable weight was defined as 20-25%

below the norm and morbid obesity was defined as 70-100% above the desirable weight for a given frame (Eknoyan, 2008).

In the mid 20th century, diabetes and cardiovascular illness were becoming a greater concern to the insurance industry, resulting in a stronger interest in stratifying risk as obesity was linked to these illnesses and greater mortality rates (Eknoyan, 2008). The shift to categorization using the BMI table occurred in 1972, when Keys and associates reintroduced a formula developed in the 19th century, the Quetelet Index (as cited in Eknoyan, 2008).

Quetelet's contribution to the social and health sciences was strongly influenced by Quetelet's interest in the Gaussian (bell) curve and in identifying population norms for weight (as cited in Eknoyan, 2008). Developing height and weight tables to study their relationships, Quetelet found it difficult to apply the bell curve to weight. The Quetelet formula was developed to provide a numerical value that could be used to study the distribution of weights across the population.

Several researchers have criticized the BMI model (Flegal et al., 2010; Shah & Braverman, 2012). Some researchers identified the BMI's limitations to measure ethnically diverse population norms (it was normed on Anglo-Saxons) and found it insensitive to health relative to weight in very athletic or smaller framed individuals (Eknoyan, 2008). The BMI is not used to measure fat, but is merely a comparison of

one's size in relation to population norms. The actual health risk is the level of adipose tissue, especially the level found in the abdominal area (Shah & Braverman, 2012).

While some studies showed a statistically significant correlation between BMI and body fat mass (BFM) as measured by bioelectrical impedance analysis (BIA) for obese children (Phan, Maresca, Hossain, & Datto, 2012), others indicated decreasing accuracy in capturing levels of obesity in older women using the BMI as compared to results using a dual-energy x-ray absorptiometry (DEXA) scan (Shah & Braverman, 2012). Body fat composition may have greater variance over time as hormone levels, nutrition, and lifestyle affect body composition.

Other measures exist that are more precise, though less commonly used due to cost and access. Procedures to measure body fat other than the BIA vary from the pinch method, to water immersion, to the DEXA scan. The correlation with health conditions and percentage of body fat mass may be more readily seen, but due to cost and access, these measures are not widely used (Shah & Braverman, 2012).

With averages of weight loss in most organized programs less than 15 lbs (6.80 kg) per individual (Cogan & Rothblum, 1992; Rothblum, 1999**)**, the challenge of moving from the obese category to the normal weight can seem daunting. An obese, 66" (167.64 cm) tall woman with a BMI of 35 weighing 216 lbs (97.98 kg) would need to lose 66 lbs (29.98 kg) to move into the high end of the normal BMI range of 24. According to the World Health Organization (WHO) obesity measure of BFM of 35%, the person would

need to lose at least 11% of body fat to fall into the healthy range for adult women as defined by the American Council for Exercise (Cogan & Rothblum, 1992; Rothblum, 1999).

This calculation becomes much more complicated as weight loss rarely includes only fat. As muscle is lost with the fat, the percentage of body fat is skewed, and the woman must lose more fat than muscle to move into the healthy BFM range. If she were to lose only fat, a minimum of 23.76 lbs (10.78 kg) would need to be shed.

Weight Cycling

Weight cycling and weight maintenance are also inconsistently defined in the literature. One large study ($N = 485$) involving the Women's Ischemic Weight Loss program (WISE), Olson et al., 2000 defined weight cycling as a volitional weight loss of 10 lbs at least three times. The purpose of the WISE study was to examine correlations among weight cyclers, coronary risk factors, and coronary heart disease in women. Using high density lipoprotein cholesterol (HDL-C) levels as a measure of risk, Olson et al. found a 7% lower level among weight cyclers. Olson et al. concluded that weight cycling has a direct negative impact on health via the reduced presence of HDL-C, which serves to protect against heart disease by removing low density lipoprotein from the body.

Weight Maintenance

Stevens, et al., 2006 reviewed 37 studies and found inconsistent definitions for the phenomenon of weight maintenance. Stevens et al. identified the greater emphasis on

weight loss rather than weight maintenance as the culprit. The definitions for weight maintenance ranged from at least 5 lbs (2.27 kg) of less than joining weight, within 5% of new weight, within 10% of new weight, to only 1 lb (.45 kg) variance and ≤ 3 kg weight gain. The mode definition was ±5 lbs (2.27 kg). Stevens et al. cited problems with using a standard weight rather than body percentage given that larger individuals have larger swings in body weight, suggesting that a more comprehensive definition of weight cycling should be a function of body percentage.

My study focused on the segment of weight cyclers who have lost and regained at least 20% of their body weight at least two times. The purpose for targeting the more extreme weight loss cycles relates to the level of commitment needed for consistent behavioral change as well as for managing the difficulties associated with improving metabolic repair. Successful efforts will likely be more generalizable to similar and less severe cases of obesity.

The Emergence of Obesity as a National Health Issue

The pattern of weight gain in the United States has increased since 1976, with the higher increases occurring between 1976 and 1980, 1988 and 1994, and 1999 and 2000 (Flegal et al., 2010). Overall, the upward trend seems to have flattened since 2000, with rates holding steady since that time (Flegal et al., 2010). According to the CDC (2012), in 2010 33% (78.18 million) of American adults registered as obese, and 17% of children (12.5 million) registered as obese. Several studies have indicated a link between

childhood obesity and damage to orthopedic, neurological, pulmonary, endocrine, and gastroenterological systems (Maffeis & Tato, 2001; Must & Strauss, 1999). Psychosocial damage from stigma associated with obesity as a child may result in binge eating to cope (Womble et al., 2001).

Obesity costs U.S. citizens roughly $147 billion per year (Finkelstein, Strombotne, & Popkin, 2010). Regardless of one's personal health, the cost of obesity is shared among all citizens as resources are diverted to treat the comorbid conditions associated with obesity. The cost to employers has been especially high among those who employ the very obese or morbidly obese. Columbi and Wood (2011) analyzed medical costs of a large employer. Participants included more than 15,000 employees across 29 work sites. Columbi and Wood found that the bottom 3 quartiles of employees cost $4.01 million per 1000 employees as compared to $5.26 million per 1000 in the 4th quartile. Per person, the cost was $1,250 more per year in medical costs for the heaviest 25% of the employer's workers.

Other costs associated with obesity, such as interpersonal challenges, physical challenges, reduced career opportunities, and shortened life span, likely impact individuals' desire to lose weight. Often, identified health conditions such as sexual dysfunction co-occur as a by-product of obesity. Borges et al. (2009) observed that the correlation of sexual dysfunction with metabolic syndrome warranted screenings for the condition by medical doctors. The hormonal imbalances resulting from excess adipose

tissue may result in sexual dysfunction as well as other conditions such as sleep apnea, abnormal sleep patterns, gallstones, and menstrual abnormalities (Must & Strauss, 1999). Reduced career and social opportunities as a result of fat bias (Puhl & Heuer, 2011) and potentially physical limitations also negatively contribute to quality of life. Life span is often shortened due to co-occurring cardiovascular disease, cancer, or diabetes (Must & Strauss, 1999).

The Biochemistry of Obesity and Weight Loss

Prior to sophisticated efforts to understand the metabolic processes of obesity and weight loss, the medical establishment and normative population held the belief that losing weight and maintaining the loss was simply a function of persistence and willpower. Current efforts to better understand weight loss among the obese have revealed physiological damage to parts of the brain responsible for controlling appetite and satiety, as well as impaired metabolic processes such as insulin and leptin response (Shah & Braverman, 2012; Thaler et al., 2011). Other chemical processes are impacted by the presence of excessive adipose tissue or in response to a high-fat diet, such as levels of C reactive protein, an essential element in the development of cancer (Nebeling, Rogers, Berrigan, Hursting, & Ballard-Barbash, 2004).

Physiological Forces: Hypothalamic Neural Injury

As early as 1978, Nishizaw and Bray observed reduced utilization of Free Fatty Acids (FFAs) in their experiments with rodents when ventromedial hypothalamic lesions

were introduced, suggesting that the hypothalamic region controls activation of the sympathetic nervous system. Placing rats in physically stressful situations, Nishizaw and Bray observed that physiological response such as release of glycerol and utilization of FFAs were reduced among the injured rodents. They burned less fat when exerting physical effort than their uninjured counterparts.

Though research in this area has been sparse overall, neuroscientists have recently made some progress in linking obesity to hypothalamic injury. The physiological changes that occur in a high fat diet may include the hypothalamus which is a key component in regulating satiety and appetite. Recent research performed by Thaler's group (2011), suggested damage to the hypothalamus after as few as 7 consecutive days in rodents and humans as evidenced by the increased numbers of interleukins in this area after the intervention. Continued exposure to a High Fat Diet (HFD) for 8 months resulted in a reduction in ARC (arcuate nucleus) POM (medial preoptic nucleus) neurons, suggesting injury to the ARC POM C. To study humans, magnetic resonance imaging (MRI) brain scan of a diverse sample by weight, age and gender was used. Results showed gliosis in the left MBH (medial brain hemisphere), consistent with rodents fed a HFD. Thaler and associates (2011) indicated that it is still unclear if the gliosis is pathogenic as a result of the obesity or merely a co-occurring condition.

If FFA utilization is impaired and/or one's appetite and satiety cues are impaired, "willpower" at the very least, would have to be much stronger in weight maintenance

among individuals with a history of a HFD. Whether the co-occurring gliosis happens because of the obesity or simultaneously as the obesity after chronic consumption of a HFD, the result is an individual who is unable to feel satiated with the same amount of food (and fat) as someone who has not engaged in behavior. The physical discomfort associated with hunger, or not feeling full (satiated) would make it more difficult to resist calorie dense foods, resulting in a downward spiral of healthy weight maintenance.

Experiments performed by Wang, Bomberg, Levine, Billington and Kotz (2007), further support an interaction between the performance of the ventromedial nucleus of the hypothalamus and energy intake. They manipulated levels of brain-derived neurotrophic factor (BDNF) in rodents to demonstrate how its presence in the VMH reduces energy intake. With BDNF supplied by Regenerous pharmaceuticals, researchers injected chemical BDNF resulting in a reduction of food intake after normal eating. The researchers found the higher the dosage, the greater the reduced eating response. They found that there was a 21.6% reduction 4-24 hours after injections and 10.3% to 16.3% reduction in a 24-48 hour window. The lower reduction was in response to 1 ug, the higher reduction in response to 3 ug.

Though leptin and melanocortin play a role in appetite, timing of the response did not suggest to researchers this was the mechanism being affected by the BDNF. They determined the delay suggests an activation and/or inhibition either of neural circuits or a transport to other sites for long term effects to occur. Researchers performed at the end

of the experiment to identify place of injections (uni- or bi-lateral) and eliminate rodents with poorly placed injections from data collection. The dissection precluded assessment of long term effects.

Levin (2000) brought up concerns regarding multi-generational damage to neuronal brain structures. He theorized that neuronal imprinting occurs both pre- and post-natal on individuals genetically predisposed to obesity, suggesting that as more obese women give birth, future generations will have higher obesity rates. This pattern will result in a larger group of chronic care patients in the area of healthy weight maintenance among the formerly obese and overweight.

Parker-Pope (2011) provided a summary of the biochemical challenges associated with weight cycling. The body's response to weight loss is to produce more ghrelin (increasing hunger), and less peptide YY (decreasing satiety). Leptin levels are also lowered post weight loss. Leptin is produced in adipose tissue and informs the body it is full. Citing multiple studies in her article, she highlights Bouchard and Tremblay's (1990) twin studies' discovery: Biological determinants must influence the body's response to binging, especially in regards to quantity and location of adipose deposits. The chromosomal variant, FTO, increases the odds of becoming overweight or obese from 30% with 1 copy of the gene to 60% with 2 copies of the gene) (Frayling, cited in Parker-Pope, 2011). Individuals possessing the gene also showed a preference for slightly higher fat foods. Children with the variant gene were observed eating approximately 100

calories more per day, choosing higher fat foods than children without the variant (Bouchard & Tremblay, cited in Parker-Pope, 2011). The variant is fairly common, with 65% of Europeans and 27% to 44% of Asians estimated to possess the FTO gene that inclines the individual to eat higher fat foods than his or her peers.

Psycho-Biochemistry

Monoamines, appetite, and food. Psychological states and mental health have also been identified as important correlates of weight and weight change. The literature contains a wealth of studies correlating depression and obesity (Goldbacher & Matthews, 2007), and co-morbid psychopathology and binge eating (Isnard, et al., 2003). For example, in a study ($N = 102$, mean age 14 years old, 66% female, 34% male) examining the incidence of psychopathology in binge eaters versus non binge eaters, Isnard et al. (2003) found that binge eating adolescents had a much higher rate of depression or anxiety based on the self-report used. Depression symptoms such as appetite disturbance, sleep disturbance, increased isolation, and decreased activity can trigger or exacerbate weight issues. The symptoms of hyperphagia and hypophagia are common with depressed patients. Excessive eating results in excessive calories that the person cannot metabolize, becoming stored as fat.

Murphy et al. (2009) identified higher rates of overeating among obese individuals reporting depression as compared to non-obese individuals. Obese individuals who reported depression also reported a greater frequency and greater duration of

depressed episodes, as well as greater preoccupation with death during a depressed episode. The rate of depression was not higher, but the severity, frequency, duration and thoughts of hopelessness were greater among obese individuals who reported depression than those who were not obese (Murphy et al., 2009).

Monoamines and mood. Serotonin serves to control appetite, libido, the sleep/wake cycle and intestinal motility. Low levels are associated with poor impulse control, feeling depressed, and obsession (Rothman, Blough, & Baumann, 2008). Dopamine is associated with volitional action, motivation, and reward seeking. Low levels of dopamine result in slowed behaviors, slow reaction and anhedonia (Rothman et al., 2008). The symptoms as described by DSM IV-TR (2000) of increased isolation during a depressed episode, less activity, excessive fatigue and sleep disturbance can lead to weight gain as a result of inactivity.

Medications targeting serotonin and dopamine levels have produced the desired anorectic effect in subjects, but include association with undesirable side effects such as insomnia, increased anxiety, nausea or vomiting, diarrhea, sleepiness, and sexual problems, such as delayed ejaculations in men and lack of orgasm in women, headaches, dizziness, and weight gain or loss (http://www.sertraline.com/sertraline_sideeffects.html).

Ramos, Meguid, Campos, & Coelho (2005) attempt to provide depth and breadth as much as possible to explain the roles of Neuropeptide y, α melanocyte stimulating hormone, and monoamines in eating behaviors. The processes are not well understood at

this time, so that treatments lack necessary precision to correct the dysregulation of hormones. The role of neurotransmission in hyper- and hypo-phagia has fueled attempts to find effective pharmaceutical approaches to treat obesity.

Depression and initiative. Obesity is impacted by nutrition, exercise, monoamine levels, and the organism's ability to metabolize nutrients. To better understand the role of dopamine in initiative, Faure, Reynolds, Richard and Berridge (2008) manipulated tonic dopamine levels in rats to see what role it played in eating and acting out behaviors. Rats, like humans, process emotions in the medial pre frontal cortex (Nauta, 1971 cited in Pezze, Bast, & Feldon, 2003).

The research performed by Faure et al. (2008) revealed that dopamine inhibits α-amino-3-hydroxy-5-methyl-4-isoxazoleproprionic acid (AMPA) glutamate. AMPA glutamate signals appetite and fear. Disruption in the rats resulted in greater appetite as well as greater fear (as observed through acting out behaviors associated with fear response). Researchers have found similarities in rodents and humans in genetic predisposition for appetite disturbances (Casper, Sullivan, & Tecott, 2008) as well as similarities in the fear response as expressed in the amygdala (Rosen & Donley, 2006).

Researchers have often used rodents in research to facilitate questions regarding human physiology (Rosen & Dowley, 2006). Initial research on the amygdala on rodents paved the way for our understanding of the human amygdala (Pezze et al., 2003; Rosen & Dowley, 2006).

Other Contributing Factors

Other factors affecting successful sustained weight loss include individual psychological traits, co-occurring mental illness, a history of abuse/trauma, and lifestyle.

Psychological traits. Psychological factors that may contribute to sustained weight loss have been explored in multiple studies (Elfhag & Rossner, 2005; Granburg, 2006; Williams, et al., 1996).

Of all the traits linked with successful weight management, self-efficacy may be the most prevalent. Benyamini and Raz (2007) found dispositional factors less predictive of outcome than situational factors. Dispositional optimism, perceptions of controllability, timeline, and consequences of the weight problem did not predict successful weight loss. Higher goals and greater confidence in one's attainment of the goal were the factors most strongly correlated with greater weight loss.

Benyamini and Raz (2007) suggested that the self-protective nature of dispositional optimism may undermine goal achievement. Rather than adjust behavior to reach the goal, dispositional optimism may serve to reduce dissonance when goals are not met. They suggest that optimism may be most useful when applied to a belief in goal attainment.

Psychosocial characteristics common among weight cyclers in the MONET study included lower self-efficacy, lower body self-esteem, and higher impulsivity in response to uncomfortable thoughts or feelings via overeating than non-weight cyclers (Strychar,

et al., 2009). In another study, the autonomous stance of participants and staff supporting client autonomy correlated strongly with positive sustained weight loss and behavioral change (Williams, et al., 1996).

In a study performed by Elfhag and Rossner (2005), the following traits were associated with sustained weight loss: self-monitoring, internal motivation, social support, effective coping skills for stress, autonomy and assuming responsibility for one's own life, and overall psychological strength and stability (Elfhag and Rossner, 2005). Findings in a spiritual based program showed a correlation between higher rates of self-efficacy and spiritual belief with higher levels of mindfulness, less preoccupation with food, and reduced incidence of non-hunger triggered eating. For purposes of this study, weight loss was not measured (Reicks, Mills, & Henry, 2004).

In another study, teaching skills to problem solve rather than providing an instruction only book increased efficacy and positive weight loss outcomes in families with obese children (Graves, Myers, & Clark, 1987). The element of self-efficacy in successful outcomes appears to be longstanding. Kitsantas (2000) compared groups among former overweight, normal weight, and currently overweight and showed the groups with the highest self-efficacy and self-regulation were the formerly overweight and the normal weighted.

Granburg (2006) found that healthy psychological adjustment to the new weight must occur for sustained weight loss. An identity of healthy, fit, or beautiful will support

behaviors congruent with those traits, hence the inverse (such as identifying oneself as fat, "I am fat"), will elicit behaviors congruent with that identity. The role of social feedback verifies the individual's standards and presentation as consistent with the new identity they are forming through change. Notions of idealized outcomes may need to be grieved as the person accepts the new identity to sustain change. Overemphasis on body image was identified as a poor predictor of sustained weight loss (Collins, McCabe, Jupp, and Sutton; 1983) and aligns with the congruency and idealization elements Granburg (2006) refers to.

Co-occurring mental illness. Mendelson's work (2008) revealed the complications associated with co-occurring obesity and mental illness. The illness may both trigger excessive or unhealthy eating as well as reduce efficacy in the execution of health promoting treatments**.**

ADHD. The symptoms of ADHD are inattention, impulsivity, and hyperactivity. Sub-types of ADHD include inattentive type without hyperactivity (ADD), combined type with inattention and hyperactivity, and hyperactive with impulsivity but without inattention. Individuals with ADHD often have difficulties with working memory, organization and planning. Cortese et al. (2007) conducted a study of adolescents in the 97th percentile for weight ($N = 99$) to determine the prevalence of ADHD among obese adolescents. Controlling for anxiety and depression, they found a "high probability" of co-occurring bulimic behaviors and ADHD behaviors.

Theories regarding the dopamine dysregulation and reward deficiency syndrome, inattention, and impulsivity were proposed as primary contributors to the teens' obesity. The inability to organize, execute, or remember one's food plan or exercise regimens creates barriers to conscious behavior change. Impulsivity can trigger bouts of eating calorie dense foods, as well as substituting more stimulating behaviors for planning, shopping, and cooking. Struggles with mastering time management may also inhibit effective follow through. Dawe and Loxton (2004, cited in Tor & Lee, 2008) demonstrated a correlation between binge eating and impulsivity or mental disorders with impulsivity.

Anxiety. Anxiety disorders range from specific to certain stimuli (social phobia, fear of flying) to (generalized excessive worry or chronic, free floating anxiety with no known identified trigger). In a literature review, Gariepy, Nitka, and Schmitz (2010) explore the relationship between anxiety and obesity. Of 4,002 studies, 13 were accepted for review. Most of the studies were either non-representative sampling or included additional mental health outcomes. Three additional studies were added, resulting in 16 studies whose focus was solely addressing the correlation between anxiety and obesity. Only three of the studies had less than 1,000 participants, the largest, $N = 40{,}790$ and the second largest, $N = 33{,}777$, with the remainder of studies ranging between $N = 1{,}496$ and $N = 21{,}425$.

Researchers found a weak positive correlation between anxiety and obesity (Gariepy, et al.). They cite the complexity of both conditions and an inability to determine cause based on the data. Factors that may play a role are post-traumatic stress disorder (PTSD) (which had the strongest correlation) and its role in HPA axis dysregulation. They also identify chronic health conditions known to co-occur with anxiety such as asthma potentially playing a role in the correlation. The endocrine system malfunctioning as a result of exposure to environmental insult and possible co-occurring damage to the nervous system has been explored in other studies (Elobeid & Allison, cited in Gariepy et al., 2010).

Researchers proposed such factors as social stigmatization, less opportunity (professionally and personally), and self-blame as possible factors in the emergence of anxiety in the obese (Gariepy, et al., 2010).

Bipolar disorders. Bipolar disorders range from Bipolar I with as few as one manic episode in a person's life, Bipolar II which lacks the full blown mania and may have more alternating rounds of ups and downs, Rapid Cycling with more frequent unpredictable moods swings, and Cyclothymia which in contrast is relatively mild, but still problematic for the individual. Since Bipolar Disorder is generally more of a depressive disorder, the issues with unipolar depression are a risk factor for those with Bipolar Disorder.

Rates of obesity appear significantly higher among BD (Bipolar Disorder) populations (Faglioni, Frank, Scott, Turkin, & Kupfer, 2005; Goldstein, Liu, Zivkovic, Schaffer, Chien, & Blanco, 2011; Gomes, et al., 2010). Faglioni et al. (2005) identified a rate of 48% obese in their study ($N = 171$) as measured by the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) criteria for obesity. Abdominal obesity is measured with 37 in (94 cm) as moderate risk for metabolic syndrome in men and 31.5 in (80 cm) as moderate risk for metabolic syndrome in women. While this may seem close to the current BMI defined obesity statistics at the time of this writing, the study was performed in 2003 when obesity rates in Pennsylvania were 13.3% (CDC, 2012). It is unclear what percentage of the study would be considered obese by CDC measures, but likely most individuals with such a waist circumference would measure as overweight or obese at the minimum.

In one Canadian study, Goldstein et al. (2011) observed rates of obesity in BD participants ($n = 1,905$), MDD (Major Depressive Disorder) participants ($n = 5,695$) and controls (n 35,493). As a group, combined rates of overweight, obese, and morbidly obese did not differ greatly, with combined rates of 60.88%, 58.09%, and 57.81% respectively. However, the BD participants had a rate of 5.2% of morbidly obese, MDD participants a rate of 4.19% and controls a rate of 2.27%. Gomes et al. (2010) based out of Brazil also identified higher rates of obesity among participants in a study ($N = 255$) examining a correlation between obesity and number of suicide attempts. The number of

suicide attempts increased, so did obesity rates. Over 30% of the sample was obese as compared to a rate of 11% in the general population.

Further, Ramacciottie, et al., (2005) showed higher rates of co-morbid BD and binge eating, suggesting one possible explanation for the consistent findings among researchers that whether as a result of behavioral and/or other influences, the presence of BD increases risk for obesity and its associated difficulties.

Kirkley, Kolotin, Hernandez, and Gallagher (1992) used the MMPI to measure neuroticism among obese non-binging, obese binging and obese binging/purging. Their data revealed three distinct groups psychologically with the highest scores for Hypochondriasis, Depression and Psychasthenia among obese binging/purging and lowest among obese non-binging.

Personality disorders. Characterized by issues with mood dysregulation, impulsivity and inattention (Livesley, 2012), the potential for emotional eating and forgetfulness surrounding one's goals to change health behaviors abound. Additional components of personality disorders are interpersonal difficulties, maladaptive thinking, and an unstable sense of self (Livesley, 2012). The condition may limit necessary social support to make change, increase isolation, reduce efficacy in problem solving around barriers to goals, and inconsistent attempts towards goals.

Abuse/trauma. Studies have shown a correlation between childhood trauma and obesity (Dedert, et al., 2010). A study by Alvarez, Pavao, Baumrind, and Kimerling

(2007) estimated 5% of adult U.S. obesity to childhood abuse. A study by Anda, et al., (2006, cited in Dedert, et al., 2010) showed risk of obesity to double with the occurrence of four childhood traumas. Vieweg and colleagues (2006) found similar results with veterans diagnosed with PTSD.

In a sample of *N* 46,768 veterans residing in Richmond Virginia, (*n* = 1,819 obese with PTSD, *n* = 44,959 veterans without PTSD), 82.1% of veterans diagnosed with PTSD were overweight or obese compared to 64% who were not diagnosed with PTSD (Vieweg, et al., 2006). The greatest difference between the two groups occurred in the obese category: PTSD group of 40.4% versus 30.5% in the control group. Service connected disability and co-morbid medical conditions correlated with occurrence of obesity but researchers could not determine whether the presence of PTSD increased co morbid conditions or vice versa. The overall rate of obesity was higher for veterans. The state averages for obesity in Virginia in 2006 were 20 to 24% (CDC, 2012).

In a review of the literature, Brewerton (2010) suggested a plausible link between PTSD and food addiction, comparing it to previous research done on substance addiction (alcohol, smoking, drugs), and PTSD. In some people, food substances such as sugar or salt can fire the reward center in the brain much like more commonly known addictive substances (Brewerton, 2010). He proposed that the desire to detach from PTSD symptoms and the potential reinforcement in a vulnerable brain may be the mechanism to explain increased vulnerability among trauma survivors.

The Social Psychology of Obesity and Weight Loss

The psychological, financial, and health effects of fat bias have been documented by multiple researchers (Crocker, Cornwell, & Major, 1993; Heuer, McClure & Puhl, 2011; Puhl & Heuer, 2011). Despite the evidence that the obesity epidemic is more than a "lack of willpower," a cultural norm continues to persist regarding the perception and judgment of obese individuals.

Puhl, Andreyva, and Brownell (2008) conducted a study (N = 2,290) of English speaking adults aged 25-74 to measure the occurrence of body weight discrimination. Using the Midus survey (an interdisciplinary study, N = 3,000) measuring patterns, predictors, and consequences of midlife health, wellbeing, and social interaction, Puhl et al. (2008) compared perceived discrimination among traits such as gender, race, age, weight or height, appearance, and health/nationality. Participants with incomplete surveys were excluded from the study, resulting in N = 2,290.

Multivariate logistic regression models were used to generate the odds ratio (OR) for discrimination across body weight and sociodemographic characteristics. The occurrence of perceived discrimination based on weight for women was 27% for gender, 10-11% for age, and 9% for weight. Men identified race as the highest risk for discrimination, with 17% of discriminatory experiences attributed to race. Age discrimination was identified equally often by both genders (10-11%), and appearance other than height/weight ranked third for males at 8.3%.

Moderately obese women (30-35 BMI) were three times more likely to report height/weight discrimination than their same aged male peers. Most discrimination was reported in the work setting or interpersonal relationships. Almost 60% of respondents reporting height/weight discrimination reported a life time average of four incidents related to work place discrimination (example: not hired for the job). The reported occurrence of race based discrimination in the work place was a close second at 53%. Gender based discrimination at work came in third at 40%. Statistically, the occurrence of height/weight based discrimination was virtually equal to race discrimination in the interpersonal and employment settings.

Wages and advancement are negatively impacted by BMI, as demonstrated by less pay for the same work performed by individuals in higher BMI ranges (Puhl & Heuer, 2011). An interesting data point in their study was that a 64 lb increase correlated with a 9% decrease in wages for white females. Further complicating assessment is the internalization of fat prejudice by the obese person. Crocker et al. (1993) used Goffman's construct of stigmatic conditions to assess effects of rejection among normal weighted and obese women.

Goffman (1963, cited in Crocker, et al., 1993) identified three types of stigmas: tribal, abominations of the body, and blemishes of individual character. Group affiliation and membership induced pride may provide a protective layer to rejection. Many studies

have shown that marginalized groups do not as a rule have lower self-esteem (Crocker, et al., 1993).

Citing multiple studies, Crocker, et al. (1993) show how a stigma one can rationally identify as outside of his/her control is much easier to attribute to the perceiver's worldview. A stigma associated with personal responsibility or one has little or no awareness of is more likely to result in personalization of rejection or negative judgments of self. Known coping mechanisms for depression (negative affect) include maladaptive eating, increased vegetative state, and reduced motivation for self-care or activities.

Puhl & Heuer's (2010) analysis of 549 randomly selected online images of stories about obesity revealed a pattern of ridicule by the media. Comparisons of normal weighted and obese images were analyzed for particular qualities such as whether the body was presented with a head, whether it was clothed, whether it was dressed professionally, and what kind of activity the model was engaged in (eating, exercise, etc.). The most glaring difference was the presentation of headless bodies in the literature. While 59% of overweight/obese models were shown headless, only 6% of non-overweight models were shown headless. Conversely, normal weighted models were five times more likely to be dressed professionally and 33% more likely to be shown as an advocate/expert.

Lifestyle. Kruger et al. (2006) found that of 1,958 Healthstyles respondents, almost one third had reported successfully sustaining weight loss. Relevant factors cited were more engagement in physical activity (30 minutes per day minimum), lower occurrence of over the counter use of diet/weight loss products, greater occurrence of daily weigh-ins (monitoring), two times more likely to engage in weight training, and more likely to report cooking or baking for fun. Barriers cited at a higher rate by non-losers were too little time and/or too little energy. Elfhag and Rossner (2005) observed that higher initial weight loss, reaching a personal weight loss goal, physically active lifestyle, and regular meals with breakfast daily were associated with higher rates of sustained weight loss when they analyzed data from the National Weight Control Registry (N = 10,000+). They found 20% of the successful sustained weight loss participants reported weight training as part of their health regimen.

Other practices observed by successful weight loss participants in the National Weight Control Registry were regular breakfast, attention to nutrition, attention to activity, and self-control over food intake (Elfhag & Rossner, 2005).

Sustained motivation may be one of the more challenging elements to instill. Studies using external motivation have not resulted in more positive outcomes (Meyers, Graves, Whelan, & Barclay, 1996). In a study with four groups (N = 49) to examine the efficacy of a televised program to promote weight loss, three groups were provided similar weight loss programs, but with an additional variable. Group 1 (n = 13) watched

others performing exercise on video tape, group 2 (n = 14) performed exercise for television broadcast, and group 3 (n = 18) engaged in live contact for exercise. Group 4 (n = 11) was waitlisted for any additional interventions. During the study, television watchers were as effective as the live group, but participants losing weight for the show lost the most and gained the most, suggesting external motivation. Once the intervention was over, there was no witness to their efforts.

Another study explored whether money would increase efficacy of a weight loss program. The money given for success had no statistically significant effect, but the money charged (in another group) for weight gained increased attrition and did not improve outcomes (Mavis, Stöffelmayr, & Bertram, 1996).

Rothblum (1999) points out confounds associated with discovering efficacious treatments for obesity. The literature is inconsistent with definitions and excessively simplistic in its approach, often ruling out any participants with other health conditions when assessing obesity interventions. She asked: Is this representative of the population seeking treatment?

In Rothblum's analysis of 50 studies (1999), the overwhelming flaw was the paradigm suggesting that obesity is wholly the fault of the individual, despite empirical studies demonstrating social and metabolic forces that indicate otherwise.

Psychosocial factors. As indicated earlier in the chapter, psychosocial dynamics play an important determinant in the cause and maintenance of obesity. Researchers have

also examined the role of these dimensions in weight loss and cycling. For example, Saltzer (1980) surveyed participants ($N = 79$) in a medically supervised weight loss program combining calorie restriction (500 cal per day), injection of human chorionic gonadotropin (HCG), and weekly counseling with medical staff to identify relevant factors between intentions to lose weight and actual weight lost. She assessed personal attitudes and social norms using Fishbein's model of behavioral intentions (Fishbein & Aizen, cited in Saltzer, 1980). The model measures both behavioral intent and what important others in the participant's life expect from her. Saltzer's survey (1980) showed a correlation between weight lost and stated intentions and beliefs regarding what others expected of the participant in the program. It should be noted that HCG is not a Food and Drug Association (FDA) approved drug for weight loss and the purpose of the study was to assess behavioral intentions rather than the efficacy of the drug.

Weight Loss Programs

A plethora of studies addressing the efficacy of different weight loss models are available (Cogan & Rothblum, 1992; Kruger et al., 2006; Powell, et al., 2007). Behavior modification, pharmaceutical, proprietary/medical, and surgery are the dominant approaches that have been studied scientifically. Studies measuring the efficacy of commercial weight loss programs are more limited.

Behavior Modification Programs

The principles of behavior modification stem from Skinner's work endorsing reinforcement for desired behaviors and punishment for problematic behaviors (Romanowich, Mitz, & Lamb, 2009). Expanding on Skinner's work, Bandura incorporated self-efficacy as relevant to outcomes for behavior change (Romanowich, et al., 2009). Current behavior modification programs for weight loss take a multidisciplinary approach, but programs rarely require more than 6 months participation (Angermayr, et al., 2010; Latner, Strunkard, Wilson, Jackson, Zelitch, & Labouvie, 2000). Education regarding nutrition, exercise/activity level, stress, and environmental and emotional influences for eating are provided (Angermayr, et al., 2010). Concepts such as self-efficacy and punishment/reward are commonly incorporated in behavior modification programs.

The variance in programs makes quantification of outcomes difficult. Additionally, follow up rarely exceeds 2 years (Angemayr, et al., 2010) making it difficult to ascertain whether or not behavior modification sticks post program. Angemayr et al. (2010) reviewed 25 studies (N = 7,705) that were designed to reduce cardiovascular and type II diabetes mellitus in at risk participants. Though the sample size was large, they did not find statistically significant improvements in markers associated with either illness as compared to control groups. Body Mass Index showed small effects.

Some researchers have identified an effective behavior modification program for participants targeting a 100 lb. weight loss or less (Latner, et al., 2000). The program incorporates both Skinnerian principles of reward and punishment for behavioral compliance as well as Bandura's cognitive component of self-efficacy. The program requires 100% attendance, an initial attainment of 15% weight loss of the total goal over the first 5 weeks to gain entry, and thereafter additional weight loss markers must be reached to maintain membership in what is described by the group as a "once in a lifetime opportunity," (Latner et al., 2000).

The program is designed to last 5 years and for the few who make it all the way through, (37 of 171 is the example provided for the 1992-1993 cohort) sustained weight loss at the 5 year mark was 17% of their total weight. Latner et al. (2000) identify the duration of the program being most relevant to sustained success. The strongest predictors were months in treatment, weight loss during the first month and initial BMI (the higher the BMI, the greater the weight loss).

Alterations to behavior modification programs for some demographics provides support for the underlying principle of behavior modification. Brown, Goetz, Van Sciver, Sullivan, and Hamera (2006) found a psychiatric rehabilitative approach to an outpatient weight loss program reasonably effective. Modifying a program designed for non-psychiatric participants with rehabilitative elements specific to their population

(schizophrenic), their intervention group lost 6 lbs as compared to their control group who gained 0.9 lbs over the course of the intervention.

Conclusions, directions for future research. Behavior modification programs appear to be beneficial during treatment in some programs (Latner, et al., 2000; Sarvestani, Jamalfard, Kargar, Kaveh, & Tabatabaee, 2009), but others have argued that the empirical support is lacking for long term success (Angemayr et al., 2010). Furthermore, the variation in intervention and implementation within and across programs encourages caution in generalizing the findings to the target population.

Pharmaceutical Approaches

A number of drugs have been developed, though almost as many have been discarded in the treatment of obesity. Drugs to combat obesity are designed to reduce fat absorption, reduce calorie consumption, increase energy output and thermogenesis, or facilitate glucose metabolism. These include Orlistat, phentermine, diethylproprion, and most recently, lorcaserin (Belviq).

Orlistat. Orlistat is designed to block fat absorption, but also comes with aversive side effects related to fat consumption (Li & Cheung, 2009). Snow, Barry, Fitterman, Qaseem, & Weiss (2005) identified side effects such as diarrhea, flatulence, bloating, and abdominal pain. Other researchers identified additional side effects: fatty/oily stool, fecal urgency, oily spotting, and fecal incontinence (Pagotto, Vanuzzo, Vicennati, &

Pasquali, cited in Nair & Ren, 2009). It is the only long term (>12 weeks) FDA approved drug for obesity treatment in the United States.

After conducting a meta-analysis of 29 studies of Orlistat, Li and Maglione (as cited in Li & Cheung, 2009) found that the pooled weight loss of participants was 2.59 kg (5.67 lbs) at 6 months and 2.89 kg (6.34 lbs). Other studies, including a 4 year Xenical (Xendos) study have demonstrated improvements in waist circumference, total LDL-C, blood pressure, and metabolism of blood glucose (Li & Cheung, 2009).

Lifestyle changes appear to be an important component of pharmaceutical efficacy. Nair and Ren (2009) observed that pharmaceutical interventions typically include dietary change as part of treatment. One study compared Orlistat only ($N = 55$) with those provided Orlistat and nutritional counseling. Those who received counseling maintained weight loss post program (6 months) whereas subjects not provided the counseling support did not maintain the weight loss (Woo, et al., 2007). Li and Cheung (2009) highlighted the importance of fat soluble vitamin supplementation (A, D, E, and K) for food plans implementing long term fat restriction. Fat soluble vitamins are dependent on dietary fat to be metabolized by the body. Over time, the large decrease in fat absorption while taking Orlistat (30%) could result in deficiencies of vitamins A, D, E, and K.

Satiety is the primary mechanism addressed in the use of Orlistat, designed to bind with fat receptors (Powell, et al., 2007). In Orlistat studies, 8% withdrew from trials

due to aversive side effects. Of those remaining, 35% in treatment and 25% receiving placebo reported aversive side effects typically occurring earlier in treatment. Greater adherence to a reduced fat diet resulted in fewer side effects. The rapidity of onset and associated discomfort of the side effects may enhance participant awareness of eating patterns.

Despite some researchers' position that Orlistat is a reasonably efficacious treatment, others disagree. Veerman, Barendregt, Forster, and Vos (2011) constructed a proportional multi-state life table Markov Model to analyze the probability of outcomes based on variables associated with obesity, cost of treatment, and cost of disease with or without treatment.

Comparing two groups of obese individuals, one provided Orlistat and one not provided treatment, Veerman, et al., (2011) compared the probable reduction of obesity related health risk. Parameters assumed best case response to medication, lowest attrition rate of participants, estimates of disease incident given the new weight, only half the expected weight regain per the literature, and cost of treatment, doctor's visits, time and travel for treatment. Time was factored at 25% of a standard wage ($17.44 per hour). The authors determined that from a purely mathematical perspective, the cost of treatment was not a good investment of public health funds due to negligible improvements in health and disease incidence. Unfortunately, the authors did not address quality of life as

measured by the individual when disease is perhaps delayed or reduced in intensity due to minor improvements.

Phentermine. Phentermine activates the release of norepinephrine and dopamine, resulting in reduced appetite. Combined with lifestyle changes, researchers' (Haddock, Poston, Dill, Foreyt & Ericsson, 2002) meta-analysis of six studies showed a weight loss of 3.6 kg (7.92 lbs) at 6 months post program. Phentermine is FDA approved for short term treatment (<12 weeks) (FDA, 2011), however long term efficacy (>2 years) has not been adequately measured. Snow et al. identified side effects as headache, insomnia, irritability, palpitations, and nervousness (Snow, et al., 2005).

Diethylproprion. Diethylproprion triggers release of norepinephrine, resulting in reduced appetite. In a review of 15 studies, (Haddock, et al., 2002), diethylproprion (*n* = 9 studies) performed similarly to phentermine (*n* = 6 studies) with weight losses of 6.5 kg/14.5 lbs (1.9 kg /4.3 lbs – 13.1 kg /28.14 lbs) and 6.3 kg/13.14 lbs (3.6 kg/7.14 lbs – 8.8 kg/19.64 lbs). Studies ranged in duration from 2 weeks to 12 weeks and numbers of participants in individual or pooled studies were not reported. Diethylproprion was not associated with reduced blood pressure, phentermine was. Snow, et al., (2005) identified similar side effects as those associated with phentermine: headache, insomnia, irritability, palpitations, and nervousness.

Lorcaserin. Lorcaserin is a selective serotonin 5-HT_{2c} receptor agonist, intended for use with healthy diet and exercise to manage weight in the obese as defined by BMI

≥30 (Hoy, 2013). Approved by the FDA in 2012 after a modification to reduce the risk of valvulopathy, the drug was determined to have no statistically greater risk than placebo. Side effects reported in one study of participants with type 2 diabetes (*n* = 259) include hypertension, dizziness, fatigue, cough, UTI, and nausea, with nasopharyngitis, and back pain reported by 11.3% and 11.7% of participants respectively, and headache reported by 14.5% of participants (Hoy, 2013). Hypoglycemia was reported by 29.3% of participants with type 2 diabetes. However, all side effects were also reported to a lesser degree (between 2-4%) by the placebo group with type 2 diabetes except for symptoms of headache and hypoglycemia, which were reported at a 7.4% higher rate for headache and an 8.3% higher rate for hypoglycemia (Hoy, 2013).

For the non-diabetic group (*n* = 3,195) side effects overall were much lower. Participants reported dry mouth, constipation, back pain, UTI, diarrhea, nausea, and dizziness at rates between 5-10%, with the placebo group reporting similar symptoms at an approximately 2-3% lower rate. The exception is dizziness, which was reported at 8.5% by those taking the medication as compared to 3.8% for those who were not (Hoy, 2013). Nasopharyngitis was reported at a slightly higher rate in the non-diabetic group by both controls (12.0%) and those receiving the medication (13.0%), as compared to those in the diabetic group taking medication (11.3%) and placebo (9.9%) (Hoy, 2013).

Efficacy is promising with 52 week trials showing an average weight loss of ≥5% of body weight in 37.5 % of the type 2 diabetics (*n* = 251) and 47.2% (*n* = 1561), 47.5%

(n = 1538) in two studies of non-diabetics. A weight loss of ≥10% was achieved by 16.3% of the diabetics and 22.6% of the non-diabetics in both studies (Hoy, 2013).

Phenylpropanol. Phenylpropanol was recalled in 2000 because of its increase for the risk of stroke in women (FDA, 2000). It was thought that the release of adrenaline would facilitate weight loss without negative side effects. One study examining the response in female Zucker rats (obese and non-obese) showed reduced carbohydrate consumption. Alterations in dopamine, serotonin, and 5-hydroxyindoleacetic acid (5HAA) were greater in obese rats than non-obese rats (Svec, Muehlenhein, & Porter, 2003).

Dexphenfleuramine/fenfleuramine. Dexphenfleuramine and Fenfleuramine both trigger the release of serotonin. After the product "Fen-phen" (a combination of these two drugs and phentermine) was associated with fatalities related to pulmonary hypertension and heart valve damage, the product was recalled (Li & Cheung, 2009). Individually or combined, these two drugs have been recalled by the FDA due to the potential for pulmonary hypertension and heart valve damage (FDA, 2009).

Sibutramine. Sibutramine (Meridia) was initially determined safe and effective for long term use by the FDA in 1997, but cardiovascular risk was determined too high and it was recalled in October, 2010 (FDA, 2010). Its mechanism was via the suppression of reuptake of serotonin and norepinephrine.

Sibutramine was shown to reduce weight by 5% in 86% of subjects when combined with a weight loss diet as compared with 55% on placebo (Apfelbaum, et al., cited in Nair & Ren, 2009). Further, participants showed less disinhibition, greater cognitive restraint, and less hunger with sibutramine.. Side effects of headache, dry mouth, constipation, and dizziness were present in the treatment group (Wilfey, et al., cited in Nair & Ren, 2009). A meta-analysis by Aterburm (cited in Li & Cheung, 2009) showed a weight loss of 4.45 kg (9.79 lbs) at 12 weeks, but regain in 24 weeks or less is common. A study by Nisoli (cited in Li & Cheung, 2009) showed improvements in LDL-C, HDL-C, glucose, and insulin levels.

Rimonabant. Rimonabant worked to bind with cannibinoid receptors, resulting in appetite suppression. The experimental program studying efficacy of treatment, Rimonabant in Obesity (N = 6,600) showed weight loss of 6.3-6.9 kg (13.86-15.18 lbs) in non-diabetic participants on a 600 calorie diet. Placebo weight loss ranged from 1.5-1.8 kg (3.3-3.96 lbs) for the same food plan (Pagotto, et al., cited in Nair & Ren, 2008). Due to an unacceptable rate of depression, anxiety, and suicidal thoughts associated with the use of the drug, it was recalled by the FDA in 2009 (FDA, 2009).

Other drugs. Other drugs used to control blood sugar or insulin response have been shown to facilitate weight loss for individuals diagnosed with type I or type II diabetes (Haukeland, et al., 2009; Ravussin, et al., 2009). Metformin, though its mechanism is not fully understood, reduces blood sugar, production of sugar by the liver,

and improves cardiac health (Haukeland, et al., 2009). Pramlintide increases satiety and subsequent food consumption, resulting in weight loss (Ravussin, et al., 2009).

Li and Maglione (as cited in Li & Cheung, 2009) observed a correlation between dose and weight loss with fluoxetine. A meta-analysis of multiple studies showed weight reduction of 4.75 kg (10.43 lbs) at 6 months and 3.15 kg (6.93 lbs) at 12 months. Though many studies have shown a reduction in caloric intake while on fluoxetine, specifics regarding food choices have generally been lacking (Appolinario, Bueno, & Coutinho, 2004).

Carbohydrate consumption and selective serotonin reuptake inhibitors (SSRI) may share a similar mechanism of action. Stahl (as cited in Appolinario, et al., 2004) identified the role of 5-hydroxytryptamine (5-HT) receptors in appetite regulation and suggests the short term weight loss associated with SSRI use as a result of the activation of 5-HT2c/5-HT1b. However, others (Guetteriez, et al., in Appolinario, et al., 2004) argue that fluoxetine (an SSRI) inhibits elements of neuropeptide Y expression. Ferguson and Feighner (as cited in Appolinario, et al., 2004) observed that non-depressed participants ($N = 655$) reporting carbohydrate cravings prior to the study lost the most weight.

Russell, Storlien, & Beaumont (1987) identified the relationship in animals between corticosterone levels and carbohydrate loading. They theorized that humans seek to reduce the corticosterone levels through carbohydrate loading.

Appolinario, et al., (2009) make a case for utilization of antidepressants and antiepileptics for the treatment of obesity in some patients. The most studied psychotropics for weight loss are fluoxetine, sertraline, and fluvoxamine. Venlafaxine, citalopramin, and buprion as well as topiramate and zonsimade have also been studied (Appolinario, et al., 2004).

Their argument is based on both observed evidence (patients with mood disorders or epilepsy lose weight with treatment) as well as the mechanism of the medication. The body has multiple opportunities to regulate hunger and satiety. Chemicals signal the degree of hunger during the eating phase, nutrients trigger satiety, and leptin and insulin control appetite over the long haul (Appolinario, et al., 2004).

Psychotropics interact with the chemicals associated with hunger, satiety, and appetite. Receptors that reduce appetite when signaled, the 5HT receptors, also increase satiety when present in the blood stream. Leptin plays a role in serotonin turnover, which in turn is thought to impact neuropeptide Y, also affecting food intake. Serotonin has been identified as influencing carbohydrate and fat cravings. Noradrenaline may also be interacting with neuropeptide Y and leptin. Finally, dopamine levels influence appetite and energy expenditure (Appolinario, et al., 2004).

Proprietary/Medical Programs

Medical programs involve the supervision of a physician. They are designed to promote weight loss for people with co-morbid obesity related conditions (Tsai &

Wadden, 2005). Tsai & Wadden (2005) also note that the programs typically induce weight loss of 1.4 kg weekly (≥3 lbs) for the first few months and involve lifestyle changes (diet and exercise).

Because medical programs take a very low or low-calorie approach, they come with a higher risk for gallstones, lower immunity to colds, hair loss, and constipation (JAMA, cited in Tsai and Wadden, 2005). Due to the costs and risks, treatment recommendations are limited to those with a BMI ≥ 30 and a co-occurring medical condition. On the OPTIFAST or Health Management Resources programs, the average expense is $1,700 to $2,200 per quarter, with an expected weight loss of 8% to 9% of client's weight 1 year after treatment, and 5% at 4 years (Tsai & Wadden, 2005). The three largest proprietary programs, Optifast, Health Management Resources, and Medifast vary in their compliance with the National Task Force for the Prevention and Treatment of Obesity recommendations (Tsai & Wadden, 2005).

Surgery

Surgery is used to either cause malabsorption of nutrients, restrict the capacity to consume nutrients, or combine the two procedures. Malabsorption procedures include bariatric surgery (biliopancreatic diversion), biliopancreatic diversion with duodenal switch (BPD/DS), and Roux-en-Y gastric bypass. The biliopancreatic diversion has lost favor due to problems with malnourishment in post-operative patients. Rerouting part of the small intestine creates a shorter path for the food to pass through the small intestine

into the large intestine. A more complex surgery evolved to include resecting the stomach, lengthening the section of rerouted intestine from 50 cm to 100 cm and the reorganization of the intestine such that the duodenal section (top of the small intestine that attaches to the stomach) now links the stomach to the large intestine. This process accelerates the small amount of food from the stomach to arrive in the colon much sooner than normal, creating both malabsorption (duration of absorption) and restriction (size of stomach) (Zieve, 2012). The combination results in rapid and significant weight loss.

Roux-en-Y bypass is the most commonly performed gastric bypass method in the United States. The stomach is reduced to approximately the size of an egg, and then linked in a "Y" fashion to the jejunum (middle portion of the small intestine). Guller, Klein, and Hagen (2009) cite the lesser post-operative infection, higher success rate (BMI ≤35) and overall greater weight loss 5 years post op in a small Italian study ($N = 27$) as evidence to support Roux-en-Y as a superior method. Higa, Boone, and Tienchin (2000) conducted a review of Roux-en-Y surgeries performed by the three of them ($N = 1{,}041$) and reported that with proper training, the laparoscopic version of the procedure is best for its reduced risk to the patient, providing all the benefits of Roux-en-Y: average excess weight loss at 12 months in this study was 70%, operative times averaged 60 minutes, and a short hospital stay of 1.5 days without complications or 1.9 days with complications. Excess weight was not defined in the study.

The risk factors generally associated with surgery such as death, infection, and gastric dumping (Powell, et al., 2007) support a thorough review of outcomes to better determine whether the outcome warrants the risk. A number of researchers have stated it is the only known efficacious treatment for the morbidly obese, with an average 10 year post-operative sustained weight loss of 40 lbs (Ochner, Gibson, Shanik, Goel, & Geliebter, 2011; Powell, et al., 2007).

Metabolic changes that occur post bariatric surgery suggest metabolic dysfunction in the morbidly obese. Ghrelin stimulates appetite. Peptide yy signals satiety. Leptin signals hunger. Insulin plays a role in signaling satiety (Ochner, et al., 2011). Post bariatric surgery, ghrelin, leptin, and insulin levels are lower and peptide yy levels are higher (Ochner, et al., 2011). Powell, et al. (2007) cite limited available studies meeting a strict criteria of methodological rigor for the lack of empirical data to support the cost/benefit ratio of treatment via surgery. However, other authors have identified procedures such as the Roux-En-Y as the "gold standard" for the treatment of obesity (Boeka, Prentice-Dunn, & Lokken, 2010).

Commercial Weight Loss Programs

With the inception of Weight Watchers (founded in 1963) years ago, weight loss has evolved into a $20 billion industry (ABC News, 2012) with a large array of approaches. A thorough search of the psychological/behavioral sciences and the medical/nursing literature produced few studies addressing results of standard

commercial programs. This may be because there is no perceived advantage to conducting the study. Whether stakeholders expect poor outcomes from formal studies or believe data gathered from studies would have little commercial value is unknown.

Tsai and Wadden (2005) conducted a literature review to evaluate the safety and efficacy of three different types of weight loss programs. Their search also resulted in few empirical studies on the efficacy of commercial programs. The summary of their data was included in the voluntary Guidelines for Disclosure by Commercial Programs. Panel members requested outcome data of programs, however some industry representatives stated a lack of resources or expertise to fulfill such a request. At the time of their review, Weight Watchers had three studies in the literature, Jenny Craig and L.A. Weight Loss had none.

Weight Watchers is a global company, providing optional proprietary food, low calorie exchange diets, weekly meetings, and provides a publication to promote exercise (Tsai & Wadden, 2005). They also offer online groups and tools, but this was not included in the study. The cost runs $12 per week, and results from the three studies indicated an average weight loss of 5.3% of their current weight initially with a 3.2% sustained weight loss at 2 years. Heshka, et al., (2003) found at 1 year a net loss of 3 kg (6.6 lbs) in the commercial program and 1.3 kg (2.9 lbs) in the self-help program. The second study of 48 participants compared four groups – usual care (gained 0.9 kg/2 lbs), Weight Watchers only (lost 2.6 kg/5.73 lbs), individual counseling with a dietitian (lost

8.0 kg/17.64 lbs) and Weight Watchers with individual counseling (lost 9.4 kg/20.72 lbs) at 1 year. In this study, the individual counseling was found to be the most effective single intervention. The third Weight Watchers study, (N = 80 women) had an attrition rate of 25%. At the end of the 12 week program, Weight Watchers participants lost 7.5% of their weight and the usual care group lost 1.6%. No follow up was provided (Tsai & Wadden, 2005).

Jenny Craig promotes low calorie food plans combined with exercise. Unfortunately, no empirical studies were available for a review of outcomes. Jenny Craig offers weekly individual sessions with a trained counselor (rather than group meetings) and pre-packaged food. The cost is significantly higher at $199 for enrollment and $70 to $100 per week for food (Tsai & Wadden, 2005).

Measures of efficacy for L.A. Fitness program effectiveness was also lacking empirical data. The cost is $88 plus a weekly fee of $7.00 per week times the number of weeks one commits to, paid at the time of sign up. Services are predominantly counselor oriented, with three visits per week with a trained counselor. Behavior modification strategies are addressed in counseling (Tsai & Wadden, 2005).

Summary of findings and limitations. The primary focus for lifestyle changes have been reduced calorie and/or reduced fat food plans combined with exercise. A smaller percentage of weight loss food plans promote a ketogenic diet. Ketogenic diets are higher in protein and fats, often referred to as “low carb diets.” The emphasis of this

approach is increased satiety to increase compliance. The delivery methods of semi-structured interventions have been examined to determine what is most effective both in terms of weight loss and level of engagement. Level of engagement has been associated with increased weight loss (Elfhag & Rossner, 2005; Glasgow, et. al., 2007; Morgan, Lubans, Collins, Warren, & Callister, 2009).

Adverse side effects have prevented many anti-obesity medications from remaining available. Psychotropics treating depression, anxiety and other mental health conditions have shown moderate weight loss as a secondary outcome (Powell, et al., 2007).

Bariatric surgery and its variations have been reported as the only efficacious treatment of sustained weight loss in the morbidly obese (Ochner, et al., 2011). Others have stated that the procedure is lacking in empirical evidence to support a verdict of long term healthy weight loss (Powell, et al., 2007). Commercial and self-help programs average 6 lbs/2.72 kg-8 lbs/3.63 kg sustained weight loss (Cogan & Rothblum, 1992) while bariatric surgery has reported results of 40 lb sustained weight loss 10 years post operation (Ochner, et al., 2011).

Noncompliance to the regimen of a new lifestyle appears to be the greatest challenge to sustained weight loss. The ensemble, prévention de l'obésité enfants (EPODE) project (together, let's prevent obesity) demonstrated a nearly 10% reduction in childhood obesity by taking a community approach (Katan, 2009). The author compares EPODE

against a study conducted by Saks to assess the best approach between low carbohydrate and low fat food plans for weight loss. The rate of noncompliance by participants was so high, no relevant comparison was possible. She asked, "When the most equipped are unable to adhere to a program, (well-educated, higher income) how can we expect those with higher need and fewer resources to do any better?" Rothblum (1999) promotes a paradigm shift in the treatment of obesity. Few studies assess other health markers besides weight and in most cases follow up after treatment is rarely longer than 1 year.

In a meta-study of 50 studies, Cogan and Rothman (1992) observed that the most effective interventions with the longest follow up (as long as 60 months) revealed a median weight gain of 0.4 lbs/0.18 kg. Measures from pre to post treatment intervention resulted in a more positive outcome, with a median of 12.8 lbs/5.8 kg lost (range of 2.9 lbs/1.32 kg gained to 62 lbs/28.12 kg lost). Thus, the longer follow up periods may reveal more accurately the difficulty in keeping the weight off.

Alterations to behavior modification programs for some demographics provides support for the underlying principle of behavior modification. Brown, et al. (2006) found a psychiatric rehabilitative approach to an outpatient weight loss program reasonably effective. Modifying a program designed for non-psychiatric participants with rehabilitative elements specific to their population (schizophrenic), their intervention group lost 6 lbs/2.72 kg as compared to their control group who gained .9 lbs/.41 kg over the course of the intervention.

Unfortunately, most studies appear to use 6 months as a marker for sustained weight loss, though some use 2 or more years, and only rarely are 5 or 10 year markers used. In a review of 50 studies (9 meta studies) with 163 conditions across all studies (Cogan & Rothblum, 1992), the average participant of a 13 week program lost 12.8 lbs/5.81 kg and regained 4.3 lbs/1.95 kg leaving a net loss of approximately 8.5 lbs/3.86 kg from pre-treatment weight to 10 months post treatment. For a year or so investment in exercise and focus on dietary changes, the payoff appears quite small.

Weight loss programs vary in their approach from solely behavioral to combinations of behavioral and/or pharmaceutical or surgical interventions. No single approach has demonstrated remission in the majority of participants. Weight loss averages rarely reach normal weight and if so, of those few who do lose significant weight, a large percentage regains. The absence of data collection in non-medically supervised programs has made quantification of success difficult to ascertain. Even when programs gather information to quantify success, they rarely go beyond the 2 year mark.

Weight Cycling: The Obstacle to Sustained Weight Loss

Stevens, et al. (2006) observed that no single definition exists in the literature for the phenomenon of weight cycling, attributing research's greater emphasis on weight loss rather than weight maintenance as the culprit. For purposes of this study, the population of interest was the subset of weight cyclers who have succeeded in 20% volitional weight

loss two or more times. This level of weight loss suggests morbidly obese individuals cycling and regaining, despite the enormous effort required to lose the weight.

The Study of Sustained Weight Loss

According to Anderson, Konz, Frederich, and Woods' meta-analysis of U.S. studies, few individuals successfully maintain weight loss (2001). Sumetheran et al. (2011) emphasize the hormonal response in the body as a highly relevant factor in regain. Hormones signaling satiety reduce with weight loss and hormones signaling hunger increase. Hence, though factors such as emotional eating, food addiction, impaired mental health, and cultural norms may influence one's struggle to maintain a healthy lifestyle, coping with the discomfort produced by hormonal shifts may be more relevant than previously thought.

Sumetheran et al. (2011) measured higher levels of leptin at week 62 than at week 10 relative to the amount of body fat percentage of the individual. If leptin levels increase with weight loss, could multiple rounds increase leptin levels even more? Regardless, leptin triggers hunger. The reduction in hormones responsible for signaling satiety are yet another mechanism in the body designed to maintain higher weights. Prior to the increasing availability of nutrient dense foods, this reduction likely served to protect the individual (Sumetheran, et al., 2011). It is plausible that with each round of weight loss, the weight cycler becomes battle weary; fighting hunger pains in the process of losing

weight both as a result of fewer calories and increasing leptin levels with successful weight loss.

Research on the negative health effects of weight cycling has been mixed. Researchers such as Nebeling et al. (2004) have found higher levels of C reactive protein present in weight cyclers, but others (Jeffery, Wing, & French, 1991) found no risk factors for cardiovascular disease. O'Connell, Popkess-Vawter, Schmoll, and Wendell (1998) cited the Task Force on Obesity, stating the literature remained inconclusive. Interventions targeting weight cyclers, or the prevention of regain, may be increasing. However, a review of the literature reveals a lack of empirical data.

The strategy of repeated contacts for preventing regain has been suggested. One study designed to determine best approaches for weight maintenance (Dale, et al., 2009) used a 2x2 factorial design comparing high monounsaturated fat and high carbohydrate food plans as well as high support versus low support ($N = 174$) to identify the most effective approach to healthy weight maintenance. The intervention comprised of bi-weekly weigh-ins lasting 5-10 minutes with 10 minute phone calls on alternating weeks, and a support group once per month. Based on the sustained weight loss of the high support groups, Dale et al. (2009) determined that the most relevant variable to sustained weight loss in this study was the higher frequency of contact with the support nurse.

A similar study compared weight loss maintenance interventions with support and self-directed maintenance without support to determine which treatment would be most

effective at reducing weight regain post weight loss (Cheskin, 2008). With a sample (N = 1,032) comprised of three groups (human contact, n = 342; web-based, n = 348; self-directed, n = 342). Cheskin's study found personal contact (face to face and via telephone) most effective. Cheskin's 2.5 year follow up revealed the best outcome (high touch) had a mere 3 lbs/1.36 kg less regain than the internet based group and gained back half of their weight within the 30 month mark (2008). The Internet group lost any gains over the control group it may have had at the 2 year mark. At 30 months, both groups had similar low weight loss results.

Rather than using weight loss as a measure of change among weight cyclers, O' Connell, et al. (1998) recommended using behavioral change (overeating) and principles of Reversal Theory to determine what occurs during an overeating episode as a measure for positive outcomes. Using Reversal Theory, they compared normal weighted to overweight cyclers and found that the former engaged in mastery and control states more frequently, and reported resistance to overeating 100% of the time as compared to the overweight group at 64%.

Apter's Reversal Theory (cited in Sit & Lindner, 2006) explains how motivation is experienced by healthy persons using four pairs of opposing states. Telic/paratelic is the first pair. Telic is serious minded, goal oriented, planful, and future oriented. Planful or future oriented may be associated with either anxiety or calm. Paratelic is playful,

spontaneous, emphasizes good feelings, and is present oriented. Good feelings and present orientation may be associated with boredom or excitement.

The second pair of traits is conformist or negativistic. The conformist state avoids disagreement, follows the rules, feels embarrassment or guilt when breaking a rule, is compliant, agreeable and looks to the larger group to determine behavior. The conformist state includes worry about what others think and feels protected or unprotected. The negativistic state is one where the individual stands up for self when in disagreement with others, will bend or break rules, feel anger, stubborn, rebellion, wants to be rebellious or defiant, wants to be difficult with associated feelings of being trapped or free.

The third pair of traits contrasts mastery with sympathy. In the mastery state, one feels the desire to do one's best, give 100%, be strong, hide weakness, compete, and be in control, with associated qualities of soft or hardy. Sympathy focuses on feelings rather than goals for determining action: entitled to mercy, showing weakness, being tender, abstaining from competition, and a nurturing approach (insensitive or sensitive). Alloic and Autic are the fourth states contrasted. Alloic is described as being other-oriented, putting oneself last, and viewing others as most important (shame, guilt, modesty and virtue are associated feelings with viewing others as most important). The autic state puts the self first, others come after the self; a stance of "I am most important" (humiliation/resentment and pride/gratitude are associated with I am most important).

The relevance of the master/control state being more present with successful "losers" may suggest that the shift occurs as one becomes more behaviorally focused when desiring a specific health outcome rather than tending to emotions when making health decisions. This suggests that investigating the experiences of the formerly obese may provide insights about what psychological state is needed to maintain a healthier weight.

Of greater interest may be that normal weighted participants found eating larger portions associated with fun, social events (positive feelings). For the overweight, overeating was associated with unpleasant feelings. They were conflicted about the act, and described themselves as more angry than the normal weighted participants described themselves.

Theoretical Framework

SDT emerged from Deci and Ryan's research on motivation in the 1970's and has continued to evolve as a result of collaboration from scholars from all over the world (Deci & Ryan, 2013).

During the 1970's, SCT evolved to include examples of modelling, vicarious learning, self-efficacy, and other social forces impacting behaviour (Bandura, 1977). SCT has been used in weight loss programs (Bagozzo & Edwards, cited in Benyamini & Raz, 2007), focusing on efficacy and modeling to achieve desired outcomes.

The self-determination model is comprised of five sub theories, but its essence is that volition is informed by autonomy, relatedness, and mastery (Deci & Ryan, 2013). The theories are explained in more detail in Chapter 5 as they apply to participants' experiences. The five sub theories address different sources of motivation. Cognitive evaluation theory explores how rewards, social relationships, and identity affect intrinsic motivation and preferences.

Organismic integration theory describes the internalization of extrinsic motivations and its correlation with autonomy. The theory explores the process of embracing or rejecting belief systems, noting that goals and values are informed by belief systems.

Causality orientations theory seeks to explain differences among individuals' motivations. Three types of orientation are described. Autonomy orientation is described as motivated to pursue an action for the pleasure or valuing of the action rather than a secondary reward for doing so. Control orientation is described as acting to receive rewards or approval, and an Amotivated orientation presents with a lack of confidence in competence.

Basic psychological needs theory examines the effects of support (or lack of it) on psychological needs. The needs for autonomy, competency, and relatedness must be supported to promote psychological health and the absence or opposition to meeting these needs adequately results in maladjustment.

The last sub theory, goal contents theory examines the relationship of intrinsic and extrinsic goals on psychological well-being. The theory states that intrinsic goals such as community, relationships, and personal growth lead to greater overall well-being than the pursuit of extrinsic goals such as money, beauty, or fame.

SDT examines motivation in the individual with great depth and breadth. Williams, et al. (1996) conducted a study ($N = 128$) examining the role of autonomous motivation in participation and maintenance of a weight loss program (Optifast). The researchers found higher autonomy scores predicated higher participation in weekly meetings and maintenance of weight loss 23 months post program. Ratings of perceived autonomous support from staff was also predictive of greater compliance with the program.

Some researchers have argued that research on health related behaviors has been limited by an approach assuming behaviors are rational and deliberate, creating interventions that focus solely on the targeted behavior (Keatley, et al., 2012). They argue that many health related behaviors occur on impulse and require an approach that would show a history of effectively changing impulsive behaviors such as Deci and Ryan's SDT. Their study applied SDT and condom use, physical activity, and healthy eating among undergraduate students. Keatley, et al. (2012) cited numerous health behavior studies utilizing SDT. They explain that the relevant elements in SDT for impulsive behaviors are based on the explanation that the individual's needs and social forces

interact to produce motivation. The quality of the motivation is described as autonomous and controlled. Autonomy is intrinsically driven whereas a controlled approach is extrinsically driven (social support, material reward, etc.). This study also utilized a dual systems model (simultaneous external and internal forces affecting motivation) (Keatley, et al., 2012). Their findings revealed SCT to be more effective at predicting behavior. However, they noted SDT was useful in explaining variance in physical activity among participants as well as identifying a significant trend in condom use.

The act of learning and modeling others as explained by SCT may not be adequately addressed by SDT to explain the behavior change in chronic weight cyclers.

Miller and Dollard originally developed Cognitive Theory in 1941. Albert Bandura expanded on the theory and through such famous experiments as the "Bobo Social doll" was able to demonstrate that children will emulate violence they observe. Modeling, self-efficacy, and identification with models are key components of the theory. SCT has been applied to a variety of behaviors relevant to promoting health such as dietary practices among adolescents (Dewar et al., 2012) and exercise among employed women with and without children (Tavares, et al., 2009). Dewar et al. (2012) observed that instruments for predicting dietary behaviors in adolescents were lacking. Based on Bandura's SCT, they designed a questionnaire to measure seven constructs from SCT: self-efficacy, intentions, situation, behavioral strategies, social support, outcome expectations, and outcome expectancies (measuring personal importance on

corresponding outcome expectations) to predict dietary behaviors. The questionnaire developed for this study ($N = 173$) demonstrated reliability and construct validity. Utilization of the tool may guide researchers in developing interventions designed to change constructs of the individual. Qualitative and quantitative research methods may be enhanced by utilization of the tool to identify and measure (where possible) the relevance of identified constructs in dietary behavior change.

In another study, researchers surveyed participants ($N = 1,183$) to identify relevant psychosocial constructs and social-cognitive theories (from four behavioral theories: transtheoretical model, theory of planned behavior, protection motivation theory, and SCT (Tavares, et al., 2009). The study compared two groups, employed women with young children ($n = 881$) and employed women without young children ($n = 302$). They identified self-efficacy and intention as the strongest predictors of stage of change and energy expenditure among participants in both groups (Tavares, et al., 2009). These concepts were incorporated into this study's data collection tools.

Though the health belief model has been used in other weight loss studies, many individuals with long term weight cycling appear to be less connected to the health aspects of weight and more connected to other aspects, such as appearance and social acceptability. The health belief model posits four constructs: perceived susceptibility (to illness), perceived severity, perceived barriers, and perceived benefits (Williams, et al., 1996).

SDT theory emphasizes mastery, autonomy, and relatedness. The five subtheories, cognitive evaluation theory, organismic integration theory, causality orientations theory, basic psychological needs theory, and goal contents theory integrate the individual's constructs and emotional health to explain behavior. SCT, the precursor to SDT, has a greater emphasis on modeling to explain behaviors. The underlying premise of both theories takes environment and person into account to explain behavior.

The empirical support for both theories in explaining health behaviors may inform the development of the current inquiry of participants' journey to a healthier weight and lifestyle. Understanding the perceived importance of models, social support, and self-efficacy to partcipants both before and after the change from chronic weight cycling to healthier weight maintenance may provide relative data points for future studies in the treatment of chronic weight cycling.

Summary and Transition

Chapter 2 provides research supporting the varied elements of healthy weight maintenance among former weight cyclers. Database search terms used from the literature review were listed, definitions of obesity were provided, weight loss and weight maintenance, concepts of weight cycling and weight maintenance were explored, the emergence of obesity as a national health issue was addressed, and the biochemistry of obesity and weight loss were reviewed, as well as the social psychology of obesity and weight loss. Efficacy of weight loss programs, (pharmaceutical,

proprietary/medical/commercial weight loss programs) were discussed, the phenomena of weight cycling, and other contributing factors (psychological traits, lifestyle, co-occurring mental illness, and psychosocial factors) were also identified.

Chapter 3 will review the research method used to obtain data for this study. Research design and rationale, role of researcher, methodology, instrumentation and materials, procedures, data analysis plan, issues of trustworthiness, and ethical procedures are reviewed.

Chapter 3: Research Method

The purpose of this narrative study was to explore the experiences and key events that allowed former weight cyclers to sustain healthier weight over the long term. The following sections present the research design and rationale for choosing this approach, the role of the researcher and any known biases, and the methodology (instrumentation and materials, data analysis plan, ethical procedures, data collection and analysis).

Research Design and Rationale

I used a narrative analysis as the qualitative design to answer the following research question: What do the narratives of formerly obese weight cyclers tell us about overcoming barriers to healthy weight maintenance? The following subquestions were also explored:

- How does the narrative start?
- What are the turning points in the journey?
- What is the meaning of repeated efforts?
- How is the self or identity described?
- What are the meaningful sources of support?
- What is the present moment of the narrative?

I chose a qualitative approach to better understand the journey of formerly obese weight cyclers as they moved to a place of healthy weight maintenance. Although numerous researchers have quantified varying degrees of success in individuals who have

implemented lifestyle changes to improve their health, no researcher has explored the narratives of successful individuals to better understand the turning points for overcoming barriers. The narrative approach was chosen over other qualitative approaches to allow an exploration of the temporal, subjective, constructed experience of those who have overcome common barriers to this health challenge.

Other qualitative designs were rejected because they were not suited to the research question. A case study approach involves generalizing to theoretical propositions (Reissman, 2008). I sought to understand the phenomenon of overcoming weight cycling. However, the phenomenological approach was not chosen because it is better suited to a phenomenon that occurs at a fixed point in time. My study involved exploring the process over time. Ethnography was not chosen because the research question was not concerned with a particular cultural experience. Grounded theory was not chosen because the study was intended to explore the experiences of former weight cyclers, not to develop a new theory.

The central phenomenon of the study was the narrative arc of what individuals experience when moving from obesity through healthy weight loss and maintenance. To better understand the human experience, it is appropriate to choose a framework moving beyond the bio-physiological models into social psychology models. Two theoretical frameworks were applied to develop relevant thematic elements: SCT and SDT. I

anticipated that the results would help providers and clients, as well as provide important insights for future quantitative studies.

The Role of the Researcher

The role of researcher in qualitative studies has been defined as one who strives to be objective in their analysis of the subject (Clanindin, 2007). The role has been conceptualized as a continuum, ranging from observer to participant observer (Hellawell, 2006). In narrative analysis, the interview narratives are co-constructed between the researcher and participant, so that the role is located on the participant observer side of the continuum (Clanindin, 2007; Reissman, 2008).

As the researcher, I recognized that my biases, beliefs, and values about weight fluctuations and obesity may have played a role in identification and shaping of recurring themes. Therefore I employed the following procedures to minimize these risks. Member checking was used to ensure the accuracy of my summary of the interview transcripts (Shenton, 2004: Stake, as cited in Creswell, 2007). Each participant was given the opportunity to review a detailed summary of the transcript and provide feedback in the form of modifications, deletions, or additions to the text. For example, if a participant spoke of multiple experiences and I incorrectly interpreted greater or lesser significance of these events, the participant was able to clarify how these events should have been represented.

Audit trails provide transparency into the research process to further illuminate the intrusion of any biases (Creswell, 2007; Shenton, 2004). I used a diary detailing research activities such as preparation for interviews, interview notes and debriefing, summary and coding strategies, analytic approaches, and emerging themes. This was done to enhance potential for transferability of the process as well as to distinguish my beliefs from those of the participants (Patton, 2002; Shenton, 2004).

Other Ethical Issues

I had to consider ethical issues to protect the well-being of the interviewees. The greatest ethical concern was related to the participants who were family members (a mother, her sister, and her two children) sharing their story publicly with me. All participants were volunteers responding to advertisements or invitations to participate in the study. Participants were informed of risks through the informed consent process and post-interview process. The family members were aware of each other's participation. In fact, they made reference to each other's stories and recognized that each person would share his or her own story. For example, P2 said "Anyway, food and weight management is a big part of my family and I won't tell you much about my mom or my sister because if they participated in your study then you can hear it from them, and I don't want to taint anything." P3 also reported an intention to wait until after the interview to discuss it with P2: "When I saw (P2) on Saturday he would not talk about this interview… he had some things to tell me and asked me but he said he didn't want to do it until after I was

interviewed." Members of this family reported that they attended support groups together and discussed their weight loss and maintenance efforts at family gatherings. P2 expressed an interest in reading the dissertation in its entirety; P5 expressed an interest in reading a summary. None of the family members indicated any perceived threat. No apparent distress or concern was expressed by any of the family members during the interview or debriefing process. The consequence of loss of confidentiality was mitigated by their familiarity with each other's story and their understanding of how the results would be shared. None of the participants had a relationship with me prior to the invitation. Participants were also told that they were free to terminate their participation at any time without penalty or risk.

Methodology

Participant Selection

Context. Recruitment for the study took place in an urban geographic location in the Northwestern United States and also on social media (Facebook, Twitter, professional website, and Walden University's website). This geographic area had five hospitals that offered medical weight loss surgeries and/or lifestyle change programs, two independent medically supervised lifestyle change (behavior modification) programs, and approximately three separate product based programs (Medifast, Optifast, and Sensa). The major commercial weight loss programs were represented as well: Weight Watchers,

Jenny Craig, and LA Weight Loss. Overeaters Anonymous (OA) also had a presence in the area.

Sampling strategy. Criterion sampling was used to find cases that met the criteria developed for this study. Criteria for inclusion were a history of 20% of weight lost and regained at least two times and a current maintenance of healthier weight (20% less than highest weight) for at least 2 years. Participants were required to be over 18 years of age and be free of active addictions, active eating disorders, and physical or mental conditions or serious illnesses known to impact appetite or weight per self-report at the time of the study. My current and former clients were also excluded.

Saturation. The desired sample size of 12-16 participants was determined from recommendations made by several qualitative methodologists describing guidelines for reaching saturation, or the point at which no new or relevant information emerges from the data with respect to the themes or theory (Saumere & Given, 2008). Mason (2010) described a lack of precision or agreement on a standard number to reach saturation. Guest, Bunce, and Johnson (2006) operationalized saturation in terms of data and thematic exhaustion and variability within the data set in order to get a more rigorous estimate of the fewest number of interviews necessary to attain a thorough understanding of the phenomenon of interest. Guest et al.'s findings indicated that, with a homogeneous sample, six participants were sufficient to achieve data saturation, and 12 participants

were sufficient to achieve thematic saturation. Guest et al. also demonstrated how to determine when saturation is reached.

The study goal was to select a homogenous group with respect to the common experience of weight maintenance after weight loss so that the guidelines suggested by Guest et al. (2006) for data saturation would be relevant. The intent during the course of data collection was to determine whether more or fewer participants would be needed as themes emerged from analysis of the participants' stories. I planned to analyze the first six transcripts and then analyze each subsequent transcript for additional themes to add to the understanding of this phenomenon, noting when the codes and variation of themes became redundant and no new themes or codes emerged. Issues of data and thematic saturation are described in Chapter 4.

Invitation and Recruitment

I posted an announcement in the form of a social media (i.e., Facebook) invitation to friends on my Facebook page and visitors to my professional website (Appendix A). A hardcopy version was posted at various locations serving weight cyclers.

Instrumentation and Materials

I developed a, semi structured interview guide for collecting the qualitative data from participants to address the research question: What do the narratives of formerly obese weight cyclers tell us about overcoming barriers to healthy weight maintenance?

I developed the interview guide based on a convergence of the identified gaps in the literature, potential themes as suggested by the theoretical frameworks in other studies (Bandura, 2004; Benyamini & Raz, 2007; Dewar et al., 2012; Williams et al., 1996), and my professional observations. This guide was submitted for review to a panel of qualitative and content experts to establish face and content validity. The interview questions (presented in Table 1) aligned with the research subquestions. I was mindful that the actual sequence of the semi structured interview may not correspond to the exact order or phrasing of the questions, and may call for improvisation (Myers & Newman, 2007; Patton, 2002). Riessman (2000) noted that the participant may respond with a list or a lengthy story in response to an interviewer's question, which requires a negotiation between researcher and participant about placement of the response in the narrative arc, and the relevance of the response to the narrative.

* These questions were included as the participants spontaneously identify this area in the narrative.

Procedures

Data collection. Once the applicants responded and met the criteria for participation, face to face interviews were to be scheduled to take place in a meeting room either in a closed meeting room at the library or a nearby office to balance neutrality and accessibility of interview sites. When distance was excessive, interviews were performed via Skype or phone.

Six participants were interviewed for this study. Per Guest, et al. recommendations (2006), the goal was to have 12 to 16 participants in the study. After 4 months of recruiting using multiple methods such as social media (Facebook, Twitter, professional website), hard copy advertising at local gyms, invitations to medical professionals specializing in treating the obese, colleagues, friends, the Walden University participant pool, and local weight loss programs only two contacts made referrals.

The first referral resulted in one interview, the second referral resulted in four interviews from the same family, and the final interview was a referral from the family interviewed. The challenges of recruiting and the implications of the composition of the sample are discussed in below in Ethical Issues and in Chapter 5.

At times the response from medical providers was positive, but for the most part, professionals appeared to respond as gatekeepers to their clients/patients. It is unknown if the lack of response from participants at large was due to the sensitive nature of the topic, lack of understanding of the study requirements, or simply a lack of success among individuals who are willing to share such a personal story with a stranger to contribute to scientific research.

Using the interview guide described above, I estimated that interviews would last 60 to 90 minutes. Likely, older participants or more repetitions of weight cycling would influence the duration of the interview. The interview style in narrative research is guided

by the desire to facilitate storytelling by the participant. The goal is to generate detailed accounts rather than concise or general statements (Reissman, 2008). Though narratives varied in length based on the research question, every attempt was made to keep the interview close to 60 minutes out of respect for the participant's time. Audio taping of interviews allowed for more accurate recording, precise analysis and an opportunity for an assistant, professional peer or supervisor to cross check work if necessary.

Participants were reminded at the beginning of their interview that the process can trigger uneasy feelings. Contact information for Seattle Community Network Counseling (http:www.scn.org/crisis/counseling); 211, the Seattle area resource line, and 1-866-4CRISIS or the local equivalent was provided on the consent form. The directory provided a lengthy list of counseling groups and individuals accepting clients of all economic situations. The King County 211 line provides information as requested by callers for a wide range of services, including counseling. The Crisis Line resource is staffed 24/7 by volunteers (supervised by mental health professionals) who can provide help as well as referrals. As it was unknown whether participants in other regions would participate, local 211 or their equivalent was provided at the beginning of the interview for anyone participating and residing outside the greater Seattle area.

The plan was to reach out to organizations outside the northwest if there were a shortfall of participants or saturation had not occurred at 12-16 participants. However, the efforts to engage and follow up with the original plan took almost four months. The

unwillingness of colleagues and programs to participate and lack of response from direct recruiting methods resulted in the decision to stop data collection at six participants.

Exit and debriefing. At the end of the interview, debriefing procedures included appreciation for participants' willingness to share their stories, explaining that the story is valuable regardless of how it differs or aligns with other stories, and a final inquiry regarding the completeness of their narrative ("is there anything else you'd like to tell me before we bring the interview to a close?"). Participants were reminded that a summary of the interview would be emailed for them to review (or hard copy mailed if they prefer), with an invitation to revise, correct or add to the data in order to increase accuracy and ensure that participants felt comfortable with what they disclosed. I also provided participants with the resources list and verified contact information so that a summary of the results could be sent upon conclusion of the study.

Data Analysis Plan

Atlas/ti 7 (http://www.atlasti.com/students.html) was used to assist in the organization, management, and analysis of the data. The software facilitated coding of recurring themes and words, revealing common experiences among participants within the study. Using the theoretical frameworks of SDT and SCT, I began with an a priori list of concepts to explore, including "turning points," "identity," "repeated efforts," and "support" (Appendix F). As I read and coded words and phrases, similar and comparable concepts within cases begin to emerge to create the narrative for each participant.

Common narratives and themes across cases became prominent as the narrative arc of cycling and maintenance were identified. Details of the process and results are presented in Chapter 4.

Issues of Trustworthiness

I used Guba and Lincoln's (1985) and Shenton's (2004) guidelines for managing trustworthiness, by establishing credibility, and transferability. Adoption of recognized and accepted research methods (credibility), development of familiarity with the population of interest, and purposeful sampling promoted trustworthiness that the data are valid.

Techniques for Establishing Credibility

The narrative approach is a well-recognized research method (Clanindin, 2007; Clanindin & Connelly, 2000; Creswell, 2007; Reissman, 2008). Utilizing open ended questions that derive from the literature promotes a grounded approach to the phenomenon. I have a familiarity with the population of interest, having treated chronic weight cyclers since October, 2007. It has been rewarding to observe the cessation of weight cycling as part of the client's journey.

Each person was approached using the identical protocol for the invitation and informed consent, so that only those who genuinely wanted to participate were included. I encouraged honesty and engagement by building rapport through prolonged contact. The participant was expected to interact with me on at least three occasions: the initial

screening, the interview, and the follow up where member checking would occur. As Josselson (in Clanindin, 2007, p. 539) tells us, that research is "embedded in a relationship" and influenced by the nature of the relationship built between the researcher and participant. Trust on the part of the participant and the ability to accurately capture the participant's experience on the part of the researcher impacts the credibility of the research.

In my interview protocol, I used iterative questions and probes to gain details and clarify meanings; and to identify discrepant cases and themes. I used my diary as an opportunity to reflect on the process and record my impressions of each interview session as well as in the data analysis process. After each interview, I transcribed the interviews and then summarized the transcript so that key elements of the narrative could be checked for accuracy against the audio (Carlson, 2010). Each transcript summary was e-mailed to each participant who agreed to review the summary, creating an opportunity to provide feedback by email, mail or phone. It is noted that two participants declined the offer to review their transcript.

Credibility was also enhanced by providing rich, thick, detailed descriptions of the experiences of participants' journeys from weight cycling to healthy weight maintenance. I also provided detailed descriptions of the setting, data collection, and analysis procedures to increase credibility and create a sense of coherence between the

data collection process and the results (Carlson, 2010). These results were also compared to the published scientific literature (this is discussed in Chapter 5).

With regard to saturation, I came to the process of discovering themes with an open-mind, without predetermined notions of participants' homogeneity- except for the initial determination of meeting the study criteria. Serendipitously, the final number of participants matched the suggested minimum. More importantly, the commonality of themes from participants' experiences in their weight loss journey resulted in my assessment that saturation occurred.

Techniques for Establishing Transferability

Transferability refers to providing sufficient details of phenomenon, sample, procedures and context such that the reader may understand and make inferences to circumstances in her/his own sphere (Creswell, 2007; Shenton, 2004). I made every effort to provide (a) detailed descriptions to contextualize the phenomena of weight maintenance in terms of the participants' stories and backgrounds, and (b) supported the choice and description of themes with quotes and detailed discussion so that the reader has sufficient material from which to draw meaning. I also provided details of the invitation and recruiting process, the data collection methods and tools, the length of the interviews, and the time period of data collection.

Techniques for Establishing Dependability

As described by Shenton (2004), I made every attempt to describe the processes of data collection in detail. Providing a history of the research process and documenting each step of the research, not only provided the ability to assess credibility of the research by the reader as previously mentioned, but also allowed for visibility into my responsiveness to the varied information presented by study participants (Clanindin, 2007; Carlson, 2010).

Techniques for Establishing Confirmability

Shenton (2004) described confirmability as the steps to ensure that the research findings are the results of the participants' experience, rather than those of the researcher. I bracketed my background and beliefs associated with the phenomenon of interest, prior to initiating data collection. Incorporating the use of debriefing notes after each interview as part of the audit trail to capture my observations, beliefs, surprise, or predictability (i.e., reflexivity) was helpful in identifying researcher bias and preconceived notions in the research process. Detailed descriptions of the analysis and interpretation (in Chapters 4 and 5) were done to make the process and results as transparent as possible.

Ethical Procedures

Male and female adults were invited to voluntarily participate in the study via direct passive invitation (Facebook, Twitter, professional website, and flyers) and referrals. The informed consent form which includes a statement of confidentiality and

consent to audio taping can be found in Appendix C. This form also includes a detailed description of the criteria for inclusion, interview procedures, and resources to contact should there be any experience of distress. Participants were free to withdraw at any time. An alpha numeric combination was used to create a pseudonym for each participant as a substitute for real names. It is recognized that this may minimize the revelation of identities to non-family members. However, because the sample is small and four of the six participants are related, it is likely that these individuals will recognize themselves or each other in parts of the narrative. .

Data Management

The interview was audio taped with each participants' written permission. A single copy of the audio tape was made, coded, and kept in a locked metal file cabinet. I transcribed the interview audio-tapes, and the resulting electronic files were password protected until completion of the study. They were transferred to a portable digital storage device (i.e., flash drive) and stored with the raw data in the locked file cabinets. Written notes of the interview and other audit trails were labeled for confidentiality, and kept in the locked filing cabinets as well. Electronic notes were password protected. Raw data will be stored for at least 5 years in a locked, fireproof cabinet, then destroyed.

Summary

Chapter 3 identified the Narrative approach and rationale for doing so to better understand the experience of six former obese weight cyclers. The role of the researcher,

and potential for personal and professional bias working with chronic weight cyclers in my practice were addressed. Participant selection was based on invitations via professional colleagues, social media, and snow balling (participants inviting personal contacts to participate).

I designed the questionnaire based on current research supporting SCT and SDT as theories which explain health related behavior change. It was reviewed by methodological experts to enhance rigor and credibility. Data analysis was performed using software atlas/ti 7 to identify and organize recurring themes and discrepant cases. Issues of trustworthiness and the use of ethical procedures was reviewed.

Chapter 4 describes the results of the data collection process, the analysis and interpretation of themes derived from the transcripts of the participants, as well as distinct differences in their stories, and participants' demographics. Processes to support trustworthiness will be explained.

Chapter 4: Results

The purpose of this qualitative study was to explore key events and experiences in the lives of former weight cyclers who had maintained significant weight loss for at least 2 years after multiple attempts. The central research question was the following: What do the narratives of the formerly obese reveal about weight cycling and healthy weight maintenance? A narrative analysis was conducted to capture the life stories and key moments that contributed to and challenged participants' ultimate success. The central phenomena explored were weight cycling and sustained weight loss/healthy weight maintenance. Six overarching themes emerged from the data. The following research questions were examined:

- How does the narrative start?
- What are the "turning points" in the journey?
- What is the meaning of "repeated efforts"?
- How is the "self" or "identity" described?
- What are the meaningful "sources of support"?
- What is the "present moment" of the narrative?

Chapter 4 presents the results of the data collection process, the analysis and interpretation of themes derived from the participants' transcripts, as well as a description of distinct differences in their stories and demographics. Processes to support

trustworthiness are explained. Finally, themes relevant to chronic weight cyclers are examined to provide insight about the meaning of healthy weight maintenance.

Setting

Interviews were conducted in a variety of settings based on participant request and accessibility. Per P1's request, the interview took place in a closed conference room. The interview was recorded in two sections using an audio recording device. The participant made a point of checking the recording device to make sure it was on and recording. I was unaware that P1 had professional experience in the past interviewing others through his work at a large news company, which may have influenced his response style. During one point in the interview, a group of school children walked by the window singing loud enough to be heard on the recording. P1 and I both decided to stop talking (smiling at each other) until they passed. The tone of the interview may have been more relaxed as a result. P1 was referred by a friend, which may have enhanced his comfort level in the interview.

P2 chose to Skype his interview from his work office. He was located in the Northeastern region of the United States. I was in my home during the interview. The interview proceeded without interruption except for two or three brief instances in which the family dog could be heard barking in the background. This seemed to change the tone of the interview to a more familiar, friendly exchange.

Interviews with P3, P4, P5, and P6 (all in the Eastern United States) were conducted by phone. All phone interviews had a variety of technical issues, primarily phone reception problems. The phone call with P3 began with my call from my office to her home, but the inability of the phone to hold the connection required that I take the call in my car outside of the building. Reception was improved, but rain made it difficult to hear at times. The accommodation may have reduced the formality of the call. P3 was aware I had spoken to another family member who referred her to the study, and this may have also enhanced her comfort to share her story. The call was audio recorded using a software application on the phone.

P4 was also at home when I placed the call to speak with her. Reception quality ranged from good to poor, causing me to ask her to repeat herself multiple times. However, P4's awareness that I was calling from home may have created a more familiar atmosphere. P4 was aware that I had spoken to other members of her family, and this may have increased her comfort level in speaking with me. The call was audio recorded using a software application on the phone. I attempted to use recording software on a laptop computer, but I was unable to pick up her voice via the speaker phone.

P5 was located in the Southwestern United States. I placed the call from my home to her while she was at home. She apologized immediately that her phone may cause difficulties in the interview. The call was dropped at least 3 times, requiring a call back. The process may have increased the familiarity and rapport between myself and P5 as

each interruption triggered sidebars and some humor. It also extended the length of the interview. It is difficult to quantify how much time was lost in losing the thread and resuming it. Once we determined where we left off, there may have been a reduction in hesitation because we were aware of losing time due to the challenges with the connection. She was aware that I had spoken to multiple members of her family, and this may have increased familiarity in the interview. The call was audio recorded using a software application on the phone. I attempted to use recording software on a laptop computer, but I was unable to pick up her voice via the speaker phone.

P6 was located in the Eastern United States. Reception was not an issue, but her hearing aids were not able to capture everything I said, requiring some repeating of the questions and comments I made. P6 was aware that I had spoken to her friend who referred her to the study, and this may have increased the familiarity of the interview. The call was audio recorded using a software application on the phone.

There were no personal or organizational conditions that influenced participants or their experiences at the time of the study that would influence my interpretation of the study results, such as changes in personnel, budget cuts, or other trauma. Participants and I did not share any personal affiliations other than the referral contact. There were no shared organizational affiliations. Participants were affiliated via family relationship and/or shared membership in one of two structured programs specific to weight concerns. These affiliations did not create any financial or other potential trauma.

Demographics

There were six participants in the study ranging in age from 45 years to 72 years old. Four were female (45, 68, 71, 72), and two were male (47, 48). All participants had been in long-term relationships (marriage), though one was widowed (P2) and another divorced (P6) at the time of the interview. Five of the six had children. Four of the participants were from the same family. Five of the participants were born and raised on the East Coast. One participant traveled extensively across the United States, but was primarily based on the West Coast. During the course of sharing their stories, all participants stated they were college graduates with a bachelor's degree or higher.

Data Collection

Six interviews were conducted, one face-to-face in a conference room in a professional setting close to my office, one via Skype, and the remaining four via phone. The first four interviews lasted 60 minutes, the last two were closer to 90. All interviews were audio recorded. Phone calls were recorded using software for recording phone calls. As described above, the phone was placed on speaker and audio recording software from the laptop was also used. These data collection methods were consistent with the plan presented in Chapter 3.

Technical difficulties presented in all of the audio recorded phone calls. Phone reception was the most salient difficulty, resulting in unclear recordings. For unknown reasons, the interview with P4 did not capture my questions very well on the recording,

independent from phone reception difficulties. P5 reported her phone was unreliable and that we may have difficulties sustaining a connection. She was correct. The connection was broken a number of times throughout the interview.

Transcription using Dragon software became easier with each subsequent interview. P3's interview did not transcribe well possibly due to the reliance on recording produced by the laptop software. This was the only interview to be fully transcribed without assistance from transcription software.

Interview Narratives

Participant 1 (P1). P1 had three major weight loss cycles. He defined his starting point as shortly after his marriage, around the age of 22. His childhood was spent playing sports with little attention to nutrition. His first turning point in his weight loss journey occurred when he saw a weight of 307 lbs on the scale. He stated that seeing the 3 on the scale instead of a 2 was "the most shocking thing," prompting him to track calories and read labels. He also began walking every night for 30 minutes or so. Using this method, he dropped from 307 lbs to 197 lbs over the course of 13 months in 2001. The next turning point occurred when he moved back to his hometown for a job, reunited with old friends, resumed visits to "old stomps," and resumed the habit of drinking craft beers. By 2006 he was in the 280s again and pursued lap band surgery because it was covered by his medical insurance.

He explained that the lap band surgery was a failure because his best weight post op was 212 lbs, and over the course of 2 years he continuously had his band filled and unfilled to find the right balance. Eventually, he learned "to trick the lap band using wine to loosen things up" followed by half a brick of cheese for dinner. He did this for about a year. It was when he took a vacation to Hawaii in 2010 or 2011 that he discovered he was back up to the 240s four or five years after the surgery.

Upon his return from Hawaii, his wife was diagnosed with lymphoma. The doctor told him that his "children would be orphans if (he) did not lose weight." He described this as a motivator to lose the weight but stated he was unsure if that was actually the case. He did "go into action," adding exercise to a restricted calorie diet.

He identified a friend who had been successful losing 50 lbs as a runner. He stated that he had always wanted to be a runner but lacked the confidence to try. He found a program that he "trusted he could master…. The couch to 5K." Two weeks into training he injured his leg, and other friends invited him to try bike riding. He stated that this was something he enjoyed very much and continued with after his recovery and return to running. He estimated he ran 1000 miles and biked almost 2000 miles in 2013.

He described his strategies as the adherence to routine, the love of data and software applications that measure/track food/exercise, and the use of charts. Although he did not appear to love routine, stating that at times he may be "bored to death," he did appear to enjoy collecting and analyzing the data and enjoyed the social component

connected to his exercise. He also described himself as very goal oriented. Initially he was very focused on reducing his weight in incremental goals (below 200, 185, 175). He then became very focused on achievement goals such as running 5 and 10K races or going on extended bike rides such as the Seattle to Portland (STP).

He described his identity "for the past 2 decades … a fat white guy, like millions of Americans you see every day." He described being "invisible and having no-confidence." Almost 3 years after losing the weight (starting in 2011, taking eight months to reach his current stable weight), he said, "I still feel at my core, I'm a fat guy." However, he said compliments from friends stating that he looked like "everyone else" and feeling that he looked like other people in his business meetings gave him confidence. He stated that when his weight went up, this confidence was undermined until he returned to his normal range, usually the following week.

He stated that motivators in the early weight loss cycles were primarily related to vanity. He stated the final motivator was strongly influenced by a desire for better health. At the time of his wife's diagnosis, he was dealing with high cholesterol, problems with liver function, type II diabetes, vision difficulties, as well as knee and back pain. He stated he realized if he wanted to prevent an early death, he "needed to focus on improving the things you don't see such as liver and lungs."

He described relationships as they relate to his weight as primarily influenced by supportive friends. He stated he was not close to his family of origin. The ebb and flow of

marital satisfaction had not paralleled his weight cycles, and in fact he said he felt that had she taken issue with his weight, it may have resulted in a rebellious response of even more weight gain. His friends were often at his meets and races cheering him on, as well as providing positive feedback to his Facebook posts describing his progress towards his goals.

Participant 2 (P2). P2 had four major weight loss cycles. He described his starting point at the age of 10, when he attended his first Weight Watchers meeting with his mother. Between the ages of 10 and 11, his weight changed from 101 lbs to 72 lbs. He stated that he gained the weight back after losing focus. In high school, his girlfriend at the time was diagnosed with diabetes, and "to show support I ate the same food over the next 18 months" resulting in significant weight loss. He maintained a steady weight until he went to college, which he described as grueling. His weight went from 130 lbs to 181 over the course of 4 years. In late 1991 or 1992, he initiated a weight loss program and lost 30 lbs. He said he stayed at this weight for "about 12 seconds" and stabilized at a weight of 160.

In 1994 he noticed metabolic changes with a weight gain of about 1 lb per month, although he reported he did not change his food or exercise behaviors during this time. He followed a level III food plan (Weight Watchers), which at his height, weight, and sex should have resulted in weight loss, not weight gain. Combined with an awareness that two of his grandparents died early, one at the age of 38 and the other at the age of 60, he

decided to “shift my focus to health variables I felt I could control. I began exercising to improve my health.”

At around the same time, his wife’s mother was diagnosed with cancer, resulting in a lifestyle of living alone and frequent trips to see his wife, adding another 10 lbs to his weight. He then went to a dietitian whose prescription resulted in further weight gain. He said she felt most obese people needed to learn to eat like normal people that is “increase their sensitivity for satiety cues.” Utilizing her program, he gained an additional 20 lbs over the course of 6 weeks. He said, “It was a disaster.” When he and his wife divorced, he gained a little more weight, “maxing out around 225 lbs.”

When he turned 38 he was very aware that this was the age at which one of his grandfathers died. His labs were poor with triglycerides at 500, cholesterol at 400 and he was experiencing dizzy spells as well. He had the thought that “if I’m going to live to be 100, I’m going to have to do something different.” It was during this time he was referred to a dietitian who reorganized his carbohydrate, fat, and protein ratios and insisted he add intensive exercise. He limited his bread and grain-based carbohydrates to 90 g per day.

After 2 ½ years on her program, he was down 50 lbs, and the following year lost another 10. More importantly his lab work was improved overall with normal blood sugars, LDL between 60 and 70, HDL up to 40, and only 5 mg Lipitor per day. He was eating a 1600 cal per day diet with four meals and two snacks.

The strategies he implemented were tracking and analyzing food/exercise for alignment with goals, a strong commitment to personal responsibility for his health regardless of the physiology he inherited, and a much higher than average level of persistence to maintain a desired behavior set (this follow-through is off the charts, i.e., 1000 days of consecutive journaling). He shared many inspirational phrases and a few stories that revealed an attitude of optimizing outcomes via personal decisions.

He said improved health has always been his primary motivation for weight loss. The final weight loss cycle was different from previous rounds due to the prescribed interventions by the registered dietitian. His food ratios changed and his style of exercise changed. Turning 38 (the age of his first early death grandparent), combined with worsening numbers and symptoms, may have intensified his motivation to "do whatever it takes.'

When asked to describe the role of relationships in his weight loss journey he stated that they did not play a role. However, I observed that his first cycle of weight loss occurred when joining Weight Watchers with his mother, his second round of weight loss occurred while dating a girlfriend diagnosed with diabetes, and his third round of weight loss occurred in partnership with his college roommate. His last round of weight loss occurred without a partner. He reported that as a husband and father of two young children, these relationships do inform his commitment to sustained health and longevity. His current wife has supported his lifestyle, expressing appreciation for her healthier

lifestyle and joining in with the work required to plan, shop and prepare the food for this program.

Participant 3 (P3). P3 described three rounds of 40 lbs or more weight loss, with additional cycles of approximately 20 lbs. Her starting point occurred when she noticed her weight at around age 10. At age 12 she weighed 137 lbs. Her childhood was sedentary, with an emphasis on books rather than activity. She began dieting with her mother, losing 3 to 5 lbs at a time on the "cottage cheese diet," losing 13 pounds her senior year, and then wearing a size 16 at her first job, then dropping to 145 during first semester of her freshman year.

She weighed 145 again when she married at age 19 ("almost 20"). At age 21, she went to Germany and lost 30 lbs starting an 800 cal per day diet. "As a result of the success, I reduced the calories to 600 per day" reaching her lowest adult weight at the end of summer: 129 lbs. She could not quantify the weight gain in graduate school. Her first pregnancy resulted in a net gain of 3 to 5 lbs despite weight loss efforts throughout and recalls frustration over it. Her second child was born in October, 1970. She changed doctors, but gained weight during this pregnancy as well.

Seeing a picture of herself after the birth of her second child was a turning point, motivating her to attend Weight Watchers for the first time. She maintained weight diaries from 1972 to 2014, revealing a weight range from 183 lbs in March 1972 to 132 lbs in February 1973. Two years later, she inched back up 20 lbs, then lost 20 lbs over the

next year, gaining it back the following year plus an additional 15 lbs. By 1979, she was in the 170s. She "maxed out" in June 1980 at around 177 lbs, losing 36 lbs by January 1981. She hit her goal weight in March 1982: 132 lbs. In August 1982, her doctor changed the goal weight to 140 lbs. Her weight continued to fluctuate, from 197.5 lbs in February 1991 to 139 lbs in December 2007, hovering there for close to two years. She stayed below 150 lbs until December 2010, maintaining a weight between 146.5 lbs and 157 lbs through 2014.

Her husband was treated for cancer in June 2009 until his death in January 2010. Since then she has maintained a weight in the 150s. Reviewing the numbers for this interview she realized the 150s were turning points. Another turning point for weight loss included referrals to a psychiatrist and a counselor. Wellbutrin was prescribed for "compulsive behavior such as binging" (i.e., stated an inability to eat just one cookie). From December 2006 to December 2007, she went to counseling, used hypnosis and implemented a South Beach based diet. She felt the combination of the three, (hypnosis, Wellbutrin, South Beach) contributed to successful sustained weight loss. She spoke of family attitudes about portions and expectation that "one should clean their plate" as other possible turning points for weight gain.

She always viewed herself as fat. The counseling helped her take two views of herself: a heavier self and a light self, but "I could not envision what I would look like thin," At the time of the interview, she continued to struggle with a congruent self-image

when meeting new people. She denied any history of anorexia or feeling unworthy as a result of her weight.

Her motivation to lose weight varied over the years. The first motivator (after pregnancy) was in response to the picture where she looked "just so terrible." Next, she was inspired by a desire to "look better" after the divorce. Next, weight loss was a goal driven to obtain long-term health care insurance. She met her goal and maintained the insurance at the time of the interview. After that, she stated, "…with my second husband, it was about improving how I felt physically, to be healthier, and to look better." The final round was in response to health issues which nearly resolved when the weight came off. The motivation at the time of the interview was "not wanting to be defeated again," and that she wants "to be healthy and be an active part of my grandchildren's lives." She said that with age, excess weight takes more energy and is harder to lose.

We did not discuss supportive or meaningful relationships. Her son, daughter, and sister all stopped weight cycling while using their own programs. Though retired, she kept a busy calendar: volunteering at church, tutoring, helping with her three grandchildren, serving on multiple Boards, and once a week attending two art classes, two dance classes, one tai chi class, one Weight Watchers meeting, and a personal training session.

At the time of the interview, she said recent efforts to lose weight triggered the obsession with weight, but she enjoyed organizing and spending points and wanted to maintain awareness of her success with weight loss.

Participant 4 (P4). P4 had three weight loss cycles of 20% of her highest weight at the time. Her first turning point was when she began dieting with her mother as a junior in high school. She was at 165, lost 50 lbs, but gained it back by her senior year. The next turning point occurred in 1972 when she went to Weight Watchers and lost at least 20% or more of her weight. The third round of weight loss was in 2005, 2006 when she lost 20 lbs but then in 2006, 2007 lost an additional 50 lbs, landing at a weight of 137 to 139 lbs.

The first round of weight loss began with her mother but then continued after her mother went to Germany to stay with P4's older sister. She was left in the care of the "non-eating" neighbors. She said that during those six weeks, "I starved myself." She stated that she regained the weight by the time senior pictures were taken. She remembered being more stressed about boyfriends (than weight) at the time, but stated she must have been stressed due to the fact that she really "yo – yoed."

The next turning point occurred in 1972 through Weight Watchers. She stated it was definitely 20% or more of her weight: She went from a size 18 to a size 10 during that time. She said she was in a good situation to lose weight because she had a lot of

control over her food through her work, and she was able to go to meetings and keep busy with the children at her job. She recalled a specific memory marking the time:

> P4: K, so then there was that. Then, I moved to New Orleans in 1973. So, when I moved to New Orleans in 1973, I was a size 10. …(C/P4: laughing together)...P4: I had a cute leatherette… Not really leather, faux leather, um, dress that was a size 10. I was cute. (C: Fun.) P4: I could flirt.

By 1976 she was heavy again, weighing 165 and wearing a size 16. When she married she was in the 180s, possibly in the late 1970s, early 1980s. She was attending Weight Watchers with her husband in 1986-1987 and was in "good shape." In January 1992 she weighed 200 lbs and was down to 183 by May of that year. She stated that a significant turning point occurred in 2005 when she had major surgery and ran into her friend, a hypnotist, who was looking for a "guinea pig" to work with. She stopped weighing herself when she hit 210 lbs, and believed she may have continued to gain weight. However she worked with the hypnotist to stop neurotic eating. While in recovery from surgery she made healthy substitutions in alignment with her goals with the hypnotist and lost 20 lbs. She then joined Weight Watchers and lost an additional 50 lbs resulting in a weight of 137.

Since 2007, she lowered her red flag number for her weight so that she does not "let it get out of control again." Her "red flag number" was 165 because this was a

"presentable weight." However she did notice that she "actually feels better physically at a weight between 137 and 140."

Her strategies have focused on Weight Watchers and use of the hypnotist. Her early motivators were primarily about the inability to find clothes that fit. It was not until she was older that health played a much more important role in motivating her to lose weight. She noticed that surgeries and other health interventions carry less risk at a lower weight and that the conditions improved when she was lighter. She also discovered a new motivator for sustained weight loss: genuine enjoyment of movement. She developed a love of exercise. At the recommendation of Weight Watchers, she started exercising in 1996. Due to knee issues, a significant amount of exercise occurs in the pool. She developed a habit of attending three classes a week at different times. She said her enjoyment for the social aspect, the variety with different classes, and the activity itself contributed to sustained efforts.

When asked about supportive relationships she spoke of her nephew and sister and their support for each other and sustained weight loss. Her weight loss remained steady for almost 8 years at the time of the interview. She also explained that her husband took over cooking dinner for them and has taken a very careful approach with portion control.

When asked to describe the role of weight management in her life, she explained that "If it was a pie chart, pie chart … 80%...would be thinking about food or my weight

or being disgusted that I had too much of something or fighting the urge to buy something." She thinks about food and weight constantly and said she has decided along with other family members to channel that obsession into something healthy and positive.

Participant 5 (P5). P5 was a discrepant case both in her identifying as a "strong person" and "fat," as well as her lower percentage of weight loss and weight cycling. Her story provides an example of slightly lower percentages with very similar turning points and behaviors as the other study participants.

P5 said she was 3 when her first turning point occurred. It was a dream she had where she was "excited about getting some chocolate candies only to find out they were beads" and felt disappointment in her dream. Though her childhood was very active, "I played outside all the time and enjoyed it very much," she did not enjoy sports at school because "…teachers… did not show you" how to play the games and she did not come from a "sports family."

She said the family culture of "food issues," large portions of high fat, high sugar foods informed her eating habits. Though she went to Weight Watchers with her brother and mother as a child and "learned things," there was no intention on her part to lose weight as she was not fat as a child.

A significant turning point for her was puberty. Physical changes, the loss of recess and the start of sneaking small bits of dark chocolate with a huge tablespoon of sugar contributed to weight gain. Her first significant round of weight loss began with

Weight Watchers: “I lost 16 pounds or so … did my six weeks of maintenance … became a lifetime member … there begins the mindset: I'm done dieting, I can eat.”

College was a turning point. She said,

> I went to college … I was no longer under the protection of my mother, I was eating in the dining hall. I was getting whatever food they gave me plus I had the car… I went to … college in the suburbs (unlike her brother in the city) … a car was much more necessary… I also began binging on bags of Snickers.

Very muscular, she “carried her weight well.” She returned to Weight Watchers in college, maintaining a lower weight for a few years. At 19 she weighed 147. While in Europe over the summer, she “experimented with not eating.” After an initial bout of calorie restriction, she lost $300 and rather than ask her parents for help, she restricted (more than necessary) to make her money last. Her weight came down to 132, she stopped menstruating for all but one day of the trip; she kept very active combined with a lot of walking. She used this experience as a lesson to always monitor for excessive calorie restriction.

Starting in graduate school, she weighed 145 after a round of weight loss, with a goal weight of 140. She was living with a roommate “who loved to cook but ate very little.” Using the apples from a nearby apple tree, her roommate prepared many dishes resulting in P5’s weight gain peaking at 178. She returned to Weight Watchers and

reduced her weight to 160. Her next turning point was attending Overeaters Anonymous in graduate school. However the "Christian God thing" caused her to "run away, screaming." By the time she married (after coming out of graduate school) she weighed 180 after a recent round of weight loss. Over the next couple of years, she had two miscarriages and then a normal pregnancy. She ate healthy foods, but also struggled with her addiction to sugar. She justified consuming foods such as milkshakes, saying, "The calcium is good for the baby!"

Her experience with Weight Watchers was mixed. As a child she accepted it; she then had a fairly positive experience with it, but her last round at Weight Watchers was with a leader who had only lost 15 lbs after one attempt and kept it off. Worse, the leader emphasized appearance over strength or health. Her final turning point was a return to Overeaters Anonymous after exposure to Debtors Anonymous. She was able to resolve the "Christian God thing" and utilize the philosophy of the 12 step program for food in a manner that was meaningful and effective for her.

She said that she found focusing on the 12 steps and abstinence from certain foods (unhealthy for her) was a much more consistent, sustainable process. There was no emotional trigger in response to slow weight loss that might be dealt with by eating. She also learned to implement healthier coping mechanisms for her emotions. Her food plan strategy evolved to abstain from certain foods such as sugar and dairy, to count calories as a guideline rather than a rigid tool to control her eating, to be mindful but not

obsessive about food choices, and to measure everything before she puts it on her plate. She described herself as a compulsive overeater when she is not mindful and strategic.

P5 described an identity that focused on her strength. Though her identity was focused on physical strength, this may have carried through to a focus on mental strength when she became involved with Overeaters Anonymous.

Relationships relevant to her sustained weight loss primarily revolved around group members, sponsees, and her sponsor in Overeaters Anonymous. She developed a habit of attending regularly with almost daily contact with the program.

When asked about the role weight management plays in her life, she said "Weight management is the way that helps keep me sane, so that I can be available for everybody else." Throughout the conversation regarding the 12 step program she expressed a focus on behaviors and mindset, being less concerned with the exact numbers on the scale but not completely disregarding them either.

Participant 6 (P6). P6 reported at least six major weight loss cycles of 20% of her highest weight at the time, with as many as 20 additional cycles of approximately 40 lbs. Starting her weight loss journey in 1965 when she married, she found reducing her activity, cooking with no knowledge of nutrition, and baking regularly led to rapid weight gain, going from a size 9 in high school to a size 14.

In her third year of marriage she went to Hawaii. Prior to the trip she was on diet pills but stopped taking them while on vacation. She gained so much weight on vacation,

the travel dress was too tight to wear home. She would lose 20 to 30 lbs while on diet pills, quickly gaining 10 to 15 lbs when she stopped taking them. The adoption of their first child was the next turning point. She stopped dieting and shifted to cooking and eating compulsively. During a 15 year period ending in 1984 she tried many weight loss programs including "Weight Watchers, Atkins, Stillman's, diet workshop, fasting, the cabbage soup diet and more."

She connected eating behaviors to managing emotions. She said,

> …this is emotionally binging because um, I had grown up, uh, witnessing fairly abusive relationships, uh, quite abusive actually… and um, uh, it was pretty, um, pretty abusive, and I know I'd eat… when I was married, one of the first things I said to my husband was, … If you ever lay a hand on me, I'll walk… I had in my head that we should never fight… that started the cycle of non-communication, and over that time in my marriage, I gained 85 lbs and he got three masters degrees.

She joined Overeaters Anonymous in 1984 and lost 60 lbs quickly. Challenges with children did not trigger regain. When she moved back to Massachusetts in 1986 she discovered a "stricter food program" and lost an additional 25 lbs. She incorporated abstinence from flour and sugar as a fixed element in her food plan. She also began weighing and measuring her food.

Challenging life experiences including a divorce triggered binging. She explained,

> I remember going through the divorce, and having practically a nervous breakdown, but I clung to this program, and I held onto my weight until the day of my divorce, and I remember distinctly buying a dozen donuts and eating them in the parking lot of the courthouse…and that started, um, my binging again, and I ate, I eluded the program for a number of years in my, um- and it was so hideous, and so insane, because I couldn't tell anybody I was eating, and I was gaining weight (10–15 lb weight cycles), but not so much that anybody, um, confronted me about it…well, we don't confront in Overeaters Anonymous. … An intervention *would have helped tremendously* (emphasis added). We don't do that.

She had a sponsee commit suicide in 1992 or 1993 and so she left OA and "ate (her) way back up to about 215 to 220." Though she went to Weight Watchers at 220 lbs and experienced mild success with weight loss, the next significant turning point did not occur until 2012. She went to a friend's birthday party who had over 30 years in the program. Spending the week end with her and others with similar values triggered a desire to resume abstinent eating, mostly remaining so since. She attributed her binge eating as a way to cope with unmanageable emotions. Overeaters Anonymous provided her with tools to deal with difficult issues when they arise. She developed a habit of daily contact with something program related.

When asked about her identity before her sustained weight loss, she stated that "my identity revolved around my relationships. When they were failing, I was failing,"

and she would eat to cope with that. She explained her identity no longer revolved around challenges in her relationships or her success at work. Her motivation to lose weight originally revolved around acceptance by others (her husband) but shifted to a desire for good health. All of her sisters developed serious health problems in later years, raising concerns about her own health and necessary resources if she were to become ill, triggering a commitment to preserve her health. At the time of the interview, she was working full time as a security guard.

Most of her support is derived from the 12 step program: the people she sponsors and friends in the program. She reported she has a very strong spiritual foundation and derives significant support from her concept of God. When asked what role weight management plays in her life now, she began describing the role Overeaters Anonymous plays in her life. She referred to how her "whole outlook" has changed and her awareness that certain old behaviors may not be helpful to her own or others' best interests. She said the role of weight management is within the philosophy of giving up control when you don't have it and trusting a process that's "bigger than the self."

Data Analysis

Coding

Initially, I reviewed the transcripts for expected content (*a priori* codes) based on the interview questions, coding statements related to: identity; motivators before and after the final round of weight loss; quality of life; the role of relationships; and turning points

(Appendix F). These were identified individually as I reviewed the transcripts using the search function in Atlas/ti. Then, I reviewed each transcript for *emerging* concepts; and additional codes emerged. The codes included: Achilles's Heel; adjustments to routine; apples, corn, sugar, alcohol, binge type eating, compulsion, fat – food, food anxiety, food plans, hiding, the phrase, "I'm a fat person," identity, intimacy/sex, obsession, program, protective patterns of behavior, restrictive eating, self-aware, strengths, therapy, thought patterns, and tools. From the codes and the text associated with each of the codes, I was able to group the codes into conceptually similar categories, which were re-examined and subsumed under five primary themes. This is presented as a diagram in Figure 2.

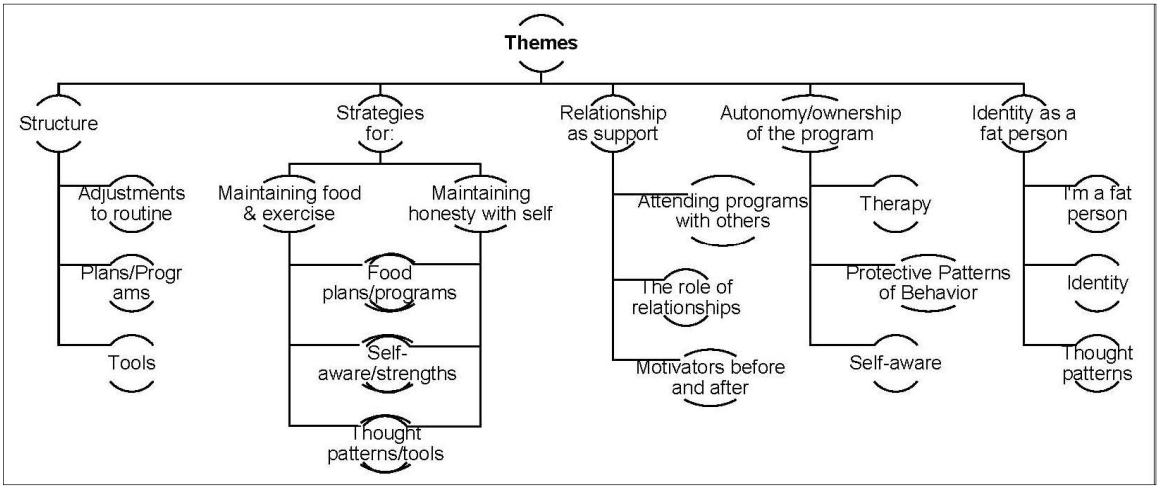

Figure 2. The five primary themes are at the top of the diagram. Underneath each theme are the codes and categories that were assigned to each theme.

Note that the theme "Strategies for" is actually composed of two sub-themes, "Maintaining food and exercise" and "maintaining honesty with self." Tools for maintaining food and exercise included planning, environmental controls, participation in groups facilitating adherence (sports, dancing, etc.), whereas tools for maintaining honesty were specific to written documentation or verbal expression of actions taken. Accountability tools may be another way to understand "maintaining honesty with self" and while congruency is necessary for successful execution, participants expressed a distinction between the mechanics of healthy lifestyle and a necessary psychological starting point.

Themes

The approach to weight loss for the participants appeared to have three different "orientations" (data, lifestyle, spiritual) which revealed recurring themes across all or

most of the participants. The emergence of the unique orientations was serendipitous to the researcher. The first two participants (P1 and P2) described their approach or program of choice as being "data-driven." They used scales, tracked numbers, and used charts to monitor and analyze their progress. Examination of the interviews of the second two participants (P3 and P4) revealed a distinctly different orientation: their weight loss activities were social and pleasurable (i.e., done in a group, or finding joy in their "physicality"). Their attention to food measurement was not as precise, and was adjusted depending on the context and activity. The final two participants (P5 and P6) attributed their success to their involvement with a spiritually-based community (i.e., 12-step program), and aligned their food choices with "moving forward without guilt and shame" and with less emphasis on physical activity to manage weight.

Structure. Structure was identified in the following codes: adjustments to routine, plans, programs, and tools. Each participant implemented and executed an organized approach to manage aspects of healthy weight management. Strategies to address disruption of the plan varied among participants, but each addressed problem areas with a solution. As mentioned previously, participants presented as three distinct pairs regarding the manner in which they organized their programs. P1 and P2 were extremely data oriented. They both described a habit of data collection and analysis with a communication style that focused on quantification to measure progress. Where P1

expressed enjoyment of data, P2 spoke in terms of problem solving or problem prevention with the use of data.

> P1: So, you know, I'm a big, I'm a, I love data and I love gadgets and stuff like that so I have all these apps that measure everything I do, uh, and, and my food and my weight and all this, and I keep track of all these charts, uh, it's, uh, uh, anyways- it's just, it's, it's a hobby I guess.
>
> P2: I also journal and so if I'm having a hard time, uh, staying in control, I can read journal entries that I wrote when I wasn't having a hard time staying in control or I can write, um, about what it is and usually it's something unrelated in my life that's going on that's causing me to expend emotional energy that I would usually spend, um, keeping on my food program. Anyway that's my long answer.

Participants 3 and 4 described a lifestyle with an emphasis on relationships and social activities. Their food met a certain criteria (informed by Weight Watchers), but was flexible and adjusted around varied obligations to others (grandchildren, volunteer work, job, classes, etc.).

> P3: So when I go to art class on Tuesday followed by dancing, I pack something that I can eat in the car. And it takes me about 20 minutes to drive from one to the other and I pack a legal meal, you know, veg- some kind of a sandwich and a wrap usually that I can eat while driving and raw

vegetables and some fruit, so I'll do that. And the class on Thursday that goes from 10 till 2. There's a potluck lunch and I said to them I can't participate in the potluck lunch and I packed my own lunch. Then, um, on the way or, you know, at lunch time I eat the lunch that I have brought and, um, sometimes I'll buy a rotisserie chicken and I'll have- I don't eat from that for most of- you know, most of the week, uh, or I'll make every once in a while, I'll make some kind of a soup and I'll eat that …

P4: Oh, lunches, um, are- I usually- Are you familiar with Weight Watchers? (C: I'm familiar; I don't know it intensely, but I-) P4: Well they have a point system and I get 26 points a day. So 6 points goes up with the coffee, with the cream and the, the oatmeal, and at lunchtime I try to have a 6- a 5, a 5 point lunch, which is maybe, uh- and that varies, I'll do some leftovers- (C: Mm-hmm). P4: … might have a small portion, or I might have, uh, um, you know, you know, we make up these things. We have this Lavash bread, and you can put- you can wrap it with some baked apple- you know, apple and you zap it in the microwave and it's like a turnover or cheese, baked cheese on it, or, you know, something kind of light…

P5 and P6 focused on aspects of spirituality when discussing weight management and health. They spoke about their work in a 12 step program to manage honesty with

self and increased awareness of their own behaviors in order to make healthier choices around food. Secondary to the role of their support system was abstinence from foods that were associated with unconscious or excessive eating they monitored caloric intake with less vigilance than the other two subsets.

> P5: I started back at OA, and what's been different is that I have a support system. I've got a bunch of men and women that I go to two meetings a week and I have all these people that know what I'm talking about, and they don't judge me when I screw up, and when they screw up, I don't judge them, and we take strength from each other's strength and weakness. I was able to admit that I had a problem because someone else admitted that they did, and, and start getting better from there, and when I need some advice about food I can call my sponsor. I've gone to a nutritionist and gotten advice from nutritionists, but, um, you know, I don't feel the need to go back at this point, maybe at some other time I will.

This is not to say that qualities which dominated one subset's approach to health excluded the others. Each subset emphasized the tools they all shared in healthy weight maintenance.

Strategies for maintaining food and exercise regimens. Strategies for maintaining food and exercise regimens were found in the following codes: food, plans, programs, self-aware, strengths, thought patterns and tools. P1 and P2 were both very

precise regarding their food plans. However, with exercise, they differed in that P1 was able to maintain a consistent schedule of exercise with minimal disruption. P2 found greater flexibility and spontaneity were required to meet his fitness goals while balancing his role as an involved parent of twin 4 year olds.

P1 had a regular menu that did not vary from week to week. On any given day, he could tell you what he would be eating that day. On rare occasions, he would allow himself to eat off plan. P2 planned family meals each week with his wife that he could adjust to each family member's carb/protein/fat ratios. He had identified a ratio that kept him lean with "a less than optimal physiology," making room for his family's nutritional needs in his regimen. Many of his meals were consistent, but not as regimented as P1. By Sunday, after the meal preparation for the week was complete, he would usually be able to tell you with precision what his meals would look like, with only small occasional deviation.

P3 and P4 were also planful in their meals, but indicated from the interviews that they had more variability and flexibility in their food plan. They planned meals, but were more inclined to assess the meal for meeting criteria as set by their food plan (points for Weight Watchers, etc.) and ease of incorporation with the planned activities of the day.

P5 and P6 took an abstinent based approach to food. They both abstained from sugar. P5 also incorporated abstinence from wheat, and dairy. P6 described an abstinence to flour, but did not specify if all flours were off the table or simply wheat. Both

expressed a willingness to be completely open about their eating behaviors on a regular basis with at least one other person to increase accountability and support. They both communicated a strong affiliation for a personal concept of God that gave them strength and serenity in the face of very difficult situations. In the past, they might have dealt with these difficulties by emotional eating.

For exercise, P1 utilized organized sports activities that he might also engage in independently as his primary source of exercise. The use of deadlines was a forcing function to maintain regular work outs, knowing that preparation for a long run or a long race would result in a much more positive experience. P2 transitioned from a very consistent workout schedule (primarily at the gym) of 5 to 6 times a week, to a highly varied schedule of 1 (rarely) to 3 (common) to 5 (rarely) times a week as a result of starting a family. His schedule became more varied as he and his wife share responsibilities for the children. To compensate, he incorporated "opportunistic" exercise into his program—for example, playing hard on the playground with his children.

P3 emphasized dance as the primary source for her exercise. As her health and life situation changed, other forms of exercise (such as biking, hiking) began to lose their attraction. Her plan now includes at least two dance classes a week and regular workouts with a personal trainer. P4 developed a plan around her knee injury. She developed a love of swimming classes (both for the swimming and the social component), and enrolled in three separate classes. She reported that her exercise program incorporates other forms of

exercise when physically possible. P5 described an active lifestyle incorporating hiking, zip lining, and other family activities as her primary form of exercise. She always viewed herself as physically strong, and this form of exercise aligns well with that image. At 72, P6 described her work as very physical, installing computers as a security guard. She stated she supplements this exercise with about two miles of walking per day in the spring, summer, and autumn.

Strategies for maintaining awareness/honesty with self. Strategies for maintaining awareness/honesty with self were found in the following codes: plans, programs, self-aware, strengths, thought patterns, and tools. Participants described different tools to achieve the necessary goal of awareness of behavior. P1 and P2 referred to the numbers to maintain awareness and compliance with their respective programs. P3 and P4 referred to the scale and a willingness to discuss their strategies and challenges with others on a similar journey. P5 and P6 used the willingness to share their story and the principles of their program for self-reflection to maintain awareness of their emotional states and ultimately eating behaviors.

Relationships as a source of support. The primary code identifying relationships as a source of support was relationships, but discussion about programs and motivators before and after also incorporate support as a recurring theme.

P1 identified friends who helped him get started with running (friend lost 50 lbs) and biking (brought him to Eastern Washington, discovered he really liked it). His friends

"cheer him on" when he is participating in sports activities. The sports may have enhanced his commitment to a healthy food regimen, but the support and recognition received from his friends were identified as strongly reinforcing for his sports activities. P2 did not directly identify relationships as a source of support, but upon further consideration of the question, identified his desire for longevity and health as strongly influenced by those he loves and who love him. Historically, he partnered with others (Mother, girlfriend, roommate) but it is unknown if these partnerships were a function of timing, convenience, and effective use of supports or actual motivation.

> P2: So I always give her some tomatoes or give her some lettuce and some oatmeal with walnuts and almond milk. And they see me eat this for breakfast even if they are eating pancakes or muffins, that's what they see me eating. And they play in the gym and they see us doing workouts and they know that we have to do workouts and that it's important and they pretend that they're doing work outs and oh, they're like, "we have to do our workout today." They'll play this game. They are comfortable in the gym. We're having a birthday party at the gym, they have … they have activities. I hated gyms as a kid.
>
> P2:…but, um, my wife does the cooking now because I'm doing the preschool pick up and drop off and she works three days a week, so she has a little bit more time, so she does the cooking and the shopping. She

> does the meal planning. She has the pamphlet from my dietitian in the folder. She plans meals to be in compliance with that– which I very much appreciate. Um, we participate- before we had kids, we did all the cooking and shopping and meal planning collaboratively. Now, unfortunately, it's mostly fallen on her, um, although I will, you know, if the schedules are such that I can do the cooking, I will, but usually she ends up doing it.
>
> P2… But, it's the most important thing in my life, and, and, I say that because the really most important things in my life, which are the people that I love, well, I can't be there for them if I'm not under control of this, so this is, I mean, maybe breathing is more important-
>
> P2… we were gonna get engaged a few months after that, and but, had she not been cooperative and supportive of my food, that would've been it, deal breaker. There were only a few things that were deal breakers…

P3, a widow, referred to her family in the course of her weight loss. Her second marriage had healthier boundaries around her weight loss journey. She stated her husband was supportive of her efforts but did not express any negative emotions when she was between weight cycles. Other family members with a history of weight cycling have been successful in maintaining a healthier weight for at least two years. She reported they check in with each other from time to time.

> P3: … I had the support of my husband then, um, also and it, and it was so interesting that the differences between my two husbands, uh, my first husband took my problems with my weight personally. He thought it was something that he was doing or that he did or whatever and I would say to him, it has nothing to do with you; this is a problem I have. It has nothing to do with you but he could not quite, um, believe that, that was- but my second husband had no, uh, took no responsibility for my (Laughs) for my having problems with my weight; it was my problem. He didn't- he only supported me if I made an effort to lose weight. He did not put any roadblocks in my way, you know, he supported whatever I wanted to do. He encouraged me to do it and he said it- he- my weight didn't matter to him except in terms of my health, um, that, you know, it would be healthier to, to weigh less but that was the only comment that he made- Yea, my husband and I did Weight Watchers together.

P4 referred to partnership with her husband (he watches portions when cooking dinner, she watches the ingredients). She also mentioned extended family functions throughout the year as an opportunity "not to be heavier than the previous one" and other family members on a similar path as a source of meaningful support.

P5 and P6 both explained that they rely strongly on the relationships in the 12 step program to maintain their programs. The relationship with sponsor, sponsees, and other

group members support sobriety from foods that reflect poor coping with life's challenges.

Autonomy/ownership of the condition. Codes revealing autonomy/ownership included therapy, protective patterns of behavior, and self-aware. All of the participants were able to identify family patterns, cultural influences, physiological vulnerability, and personal habits as precursors to the weight gain. However, they all expressed a belief that if they did something differently, they would achieve success.

P1 developed his own program, stating he did not really know why he started counting calories. However, each step on his path to improved health had been based on decisions he made to live longer.

During our interview, P2 shared his thoughts reflecting a person's role in their own success.

> So I consider myself to be very lucky and I realize that luck is a big piece of success. But I also believe that you have be in the right place at the right time and you have a lot of control of what place you're at so being in the right place at the right time isn't entirely luck. So I felt-I don't like to think of myself as a victim. Uh, I like to say some people have reasons why they can't do things and other people have obstacles that they can overcome. You've– everybody's met somebody who's got, you know, a bad knee and they don't do anything because of their bad knee and somebody else who is paralyzed who climbs mountains or

> participates in triathlons. You know, I mean there's this range and I'm on the end of the spectrum of where I don't let anything stop me from doing what I want to do. And so I spent a lot of time trying to draw the line between what's in my control and what's not in my control.

He also made a point of keeping an open mind with yet another referral to a dietitian. He explained,

> I think I probably know more about nutrition and health than a lot of new dietitian graduates. I have the experience before sitting down with a dietitian at a gym or something like that and… and, and, and feeling that I knew more than the person did but when I talked to the dietitian that I worked with the most recent time…I said let me put it to you this way, 'I think I'm already doing everything that I can, but I'm coming into this thing with an open mind, and if you tell me to do something different from what I'm doing, I'm going to do it and well see if it works. And I really hope it does. I'm not optimistic, but if fails, it is not going to be because of the defeatist attitude on my part. I'm going to do everything that I can to succeed.' And I succeeded.

P3 made statements such as, "I am a competent person… Why can't I figure this out?" This suggests an absence of blame to others for her struggle. Like other participants, she acknowledges the patterns learned and physiology that may have led to

problems with weight, but holds herself accountable for finding the solution and maintaining compliance with a program.

> P3: I try to come to peace with what I have to do- I have to really come to peace with it, that this is– that if I put as a value maintaining what's considered to be a healthy weight if I put that as a value then there are certain things I have to do.

P4 also made statements such as "problems… of my own doing" and has sought effective treatments for the problem from expert professionals such as medical doctors, dietitians, and a hypnotherapist as well as engagement with Weight Watchers.

P5 and P6 both speak about their health in terms of their 12 step program. They both described that it was up to them to participate in the program, and identified an internal locus of control towards their health and recovery.

> P6: And, um, and I know I don't want that life. I know what may be in store for me, and I'm in the process of trying to prepare myself financially to have a place to take care of me, because I know my children are in no way going to take care of me, um, and I need to take care, you know, get things in place, so that I will be taken care of.

Identity as a fat person. Codes identifying this theme were identity and "I'm a fat person." Most participants identified themselves as a fat person in some form. P1 said

that at his core, he still feels he is a fat person. However, after a little over two years, he expressed cautious optimism that the weight loss would "stick."

> P1: Yeah, it was everything. I mean I was a fat guy, and I was, I was invisible. Uh, I was, I was just, I was one of millions of fat Americans, you know, a short fat white guy walking around just like millions- you see, you know, every day around this country, that was who I was. I was, I was that fat guy, um, I- I hated myself. Um, I had no confidence, uh, at work. I had no confidence, uh, in my personal life. Um, I was, you know, ashamed of the role, uh, role model I might've been for my kids. Um, I- my wife is petite, always has been and I was ashamed of, of what we look- looked like as a couple, uh, all that stuff. It completely defined who I was for the better part of two decades.

P2 identified himself as someone who can solve hard problems and "who has the follow through as well as a meticulously regimented nature required for solving" this "hard, hard problem."

P3 reported a continued struggle to connect with an identity that is "lightweight." Her counselor posed the concept of two identities: a heavyweight and a lightweight self. She reported that though she likes the idea, it is difficult to think of herself as lightweight because she started out heavy. She also described struggling with the incongruence she

perceives is present when people meet her thinner self. “They have no idea of my history …” which causes her to feel like she is masquerading.

> P3: And then I think I'm sort of masquerading. Like people who meet me now and I'm a little bit overweight, but people who meet me now have no knowledge of me at a high weight. And I'm, I'm still inclined to say of the true me at a high weight (P3: laughing) so yeah and I'm still inclined to think that way so I have to. I am trying to change that thinking but, but, um, I'm- I've never been anorexic however.

P4 also reported an ongoing image of her core self as a fat person. She stated that her patients expressed surprise when she mentioned that she is on Weight Watchers because they do not think she’s fat. She explained further that the fat person identity is sustained due to the struggle a formerly fat person experiences that a “right size person” does not.

> P4: Uh, um, you know, I still—I think I still feel like a fat person. And, but—like my patients will offer me all kinds of goodies and I say, “na, I’m on Weight Watchers,” and they’ll say, “What?” (P4/C: laugh) P4: -and so that wha I realize is people who don’t know me think I’ve always been….. (Pause)…. Right-sized. (C: Mm-hmm) P4: Um, I mean, I’m not thin by any means, but, you know, I’m not—especially if I would lose my 3 or 4 pounds— (P4/C: laugh) P4: it would be (chuckles) less noticeable. But,

you know, when you're in—those when you're right near your goal, a few—a few pounds shows. 'Cuz there's not as much of you. (C: Mm-hmm) P4: But anyway, they don't think that I'm fat—(C: Mm-hmm) P4:-whereas I think I'm a fat person.

C: 'K, so that identity hasn't really shifted internally for you.

P4: No, no. Because you have to always, because a lot of people who are "right sized"—I'll call it that, right sized or norm—you know. (C: Mm-hmm) P4:-supposedly normal sized, um, (pause) can eat what they want, you know. It's not a struggle. They don't know th- People who meet you don't know the struggle. (C: Mm-hmm) P4: Or the, or the journey (laughs).

P5 described herself as the "thin kid" in her youth. She stated "I was the boy and my brother was the girl" because she was very active, always moving, and thin while her brother always "had his nose in a book," did not move much and was heavy early on. Her identity had evolved away from her childhood image. She explained part of her journey,

…and so I gained weight. Now mind you, I also grew up in a fat family, so the mindset was everyone was fat. I knew I wasn't at first but, I don't know, I guess I probably would've become fat anyway, but I know I wasn't as fat as I thought I was.

She struggled with the thought that people would judge her when she was large, not performing as she should, but moved to a place where "my size and what others think of it is no longer relevant." She said that she found it "freeing to realize very few people look that closely at her." Another element of her identity that stood out was being a "physically strong" person. This informed her interest in Dagorhir, a medieval style fighting activity that pushed her physically. She stated the fighting was not what attracted her, but the strength required to do the sport.

P6 also saw herself as much larger than she was. She stated that she was a size 9 in high school, but comparing herself to her friend who was "something like a size 0," she thought she was fat and a had a "horrible body image early on." She also stated that hormone deficiencies played a role in feeling bad about herself because they created some physical and physiological abnormalities. (There was no evidence the imbalance was the cause of her subsequent weight gain or loss).

She equated being thin as successful and would have higher self-esteem when she was thinner and lower when she was heavier. When asked about her identity directly, the conversation quickly moved to successful accomplishments: being thin, her professional success, being an "unsuccessful wife," "unsuccessful mother," "successful cook."

She stated that her views about where she was successful and where she wasn't haven't changed, but she forgave herself for not knowing what she didn't know. She said

that her identity was an “overeater” and “over spender.” She explained that spending was related to using things to make her children feel better when they were unhappy.

As her view of God has changed, her identity has changed from what it was in her youth. Rather than a God “out there,” she said, “God lives inside me, he is in my soul, and all of us are connected in the same way – kind of the same philosophy that the Enlightened Group had—Emerson, Thoreau and that kind of thing.”

Final Turning Points

Turning points in the journeys of participants are those experiences that triggered a weight gain or loss. There were a number of turning points participants shared as they gained their weight (adolescence, marriage, job change), and those are referenced in the narratives. The final turning points were triggered by a desire for better health and better quality of life, regardless of what had motivated them on their way to the (likely) final round of weight loss.

The final turning point for P1 was a decision based on his desire for a longer, better quality of life.

> Yeah, yeah. So not- it wasn’t, I mean looking better, fitting into clothes, being happy with what I look – see in the mirror is nice and it's a good after effect, but the real motivation was making sure that internally I- I- everything was okay, the stuff that you can't see. Your heart works, your lungs work, your liver works, all that kind of stuff, you know, took away the knee pain, took away back pain. All

> these freaking issues that I suffered with every day just when you're trying to move, uh, uh, something around that's that heavy. It all disappeared. ... more than just health, I would say to some extent, just how I felt—how you feel is also about health.

Like P1, P2 experienced a sense of urgency emerging as the result of new data. P1 received the word that his wife had Lymphoma and the doctor told him that his "children would be orphans if (he) did not lose weight." P2 was looking at rapid metabolic shifts resulting in bloodwork with "numbers off the charts" and continued weight gain on a lower calorie food plan. He explained that the imminent need for change prompted him to try a new dietitian. She identified the necessary interventions to bring about improved health if applied.

P3 who was in her 60's in the last round of weight loss said that she was "happy with life, in a relationship… just didn't feel good anymore and felt so much better when my weight was down." She said she,

> …had more energy and weight loss helped resolve a number of health problems significantly. Health problems diminished by 90%. I don't want to do this again. I'd like to be healthy. I'm just grateful I can get down and off the floor without any problem. I can carry children around. I can play with the kids, particularly as I'm aging, I feel so much better when I'm not heavy.

She also said that she is “stronger than I’ve ever been.” Weight loss historically had been driven by appearance—what she looked like at a certain weight.

P4, “healthy weighted” for almost 8 years, stating that the potential for surgery and knowledge that her health conditions would improve with weight loss were the driving force on her last round of weight loss. She said, “If surgery were still necessary, the risks of surgery would be much lower.” As a result, she lowered her red flag number to sustain control of her weight. She also described a weight loss journey that had historically been driven by “presentation,” using weight as a gauge as to when to start losing weight again.

P5 described a weight loss journey that had been riddled with guilt and frustration at her inability to control her weight. She was frustrated with her last experience at Weight Watchers, but had changed her eating habits. She re-visited 12 steps via Debtors Anonymous to support her husband and she explained:

> I learned about 12 steps, but I guess one thing I didn't tell you was that what finally drew me to OA, I had a double thing that drew me OA at the end. One, I wanted to be able to run around and play with my daughter, and I wanted to be able to go zip-lining with her, I wanted to be able to go hiking with her, and do all these active things, and I am doing those things with her now.

The other was to meet a weight requirement for a treatment to eliminate a health condition that causes significant pain. At the time of the interview, she was still saving

for the treatment but met and maintained the weight requirement. She explained that this is where the second turning point occurred in this last round of weight loss:

> It took me a year before I joined OA, the next year I joined OA, and here is the difference, here is where the story changes. Um, doing OA, I got a sponsor, and I was still using a very similar food plan, still using the Schwarzbein, as a basis for my food plan, and I got down, you know, I, I- and, and eliminating sugar. I eliminated sugar about a month after I joined OA. And, um, I had a sponsor and I was working the steps. And one day I realized I'd been at that plateau, that same plateau, I'd been there for three months and I hadn't even realized it, because I was working the steps and I was doing things differently and I was changing my life and changing the way I was thinking and- that the weight loss was sort of an incidental- it was important, but it was an incidental piece of working the 12 step.

P6 had a similar last turning point after decades of dieting to look better, she reached a point where knowledge of family history and the declining health of her siblings triggered a fear of what "could be in store for her." She has three sisters and one brother. Her narrative is only mildly edited for ease of reading:

> Okay, um, over the past- this is still hard emotionally for me. I have two sisters with Alzheimer's. I have, um- and I have to say that all of my family is overweight. My father died of a heart attack when he was 46, and, um, my mother died of a heart attack when she was 70. My mother was not obese, but she did

take pills. I don't know how long she took them, but, um, she controlled her weight, um, so, certainly being afraid of heart disease became an issue for me, and I was put on, uh, um, blood pressure medicine, and I was never put on cholesterol, but I was borderline…

Um, but the Alzheimer's- uh, my sister was, I talk about the older- uh, second to the older sister, who was a brilliant teacher, um, and she, um, started getting Alzheimer's about ten years ago, uh, and, uh, her husband took wonderful care of her, uh, she always had weight issues. She was a state teacher in Connecticut. She was brilliant. Out of all of us, she probably had the brains (in a smart family)…And, um, she's, she's a vegetable today, and this year, my brother-in-law had to institutionalize her. He found a wonderful home, and, um, she lives there. She doesn't know me. I helped him go through that process by going down with her, because he wants to wind up living there, and they live in Connecticut, and I went with her, and I stayed with her while he went shopping, um, and, uh, oh God, it was so difficult for me, and, um, so I started exercising my brain, and my body, um, I did get a dog in 2008, for the purpose of walking, because my- I knew I was too lazy to do this- that's motivation on my own, but I knew if I got a dog, I'd have to walk him…not since this winter, but we generally walk two miles…

So, I, I walk my dog, and … my other sister, I didn't know she had Alzheimer's, but I did know she has dementia, but her son tells me that she has been diagnosed with Alzheimer's. I don't know about that, but I do know that she can't remember anything, and, um, she's in a, um, not an assisted living home, but he's in the process- she lost her husband, uh, in- just before Thanksgiving, and I went up to see her, and her son is in the process of, um, moving her to the Cape. She is in Connecticut right now…and, uh, she will be moving to a, um, it will be an assisted living program, when all the kinks are worked out, if you will, and all the estate is settled.

Um, and then, my oldest sister that I lived with for ten years, um, I was not living with her at the time … Um, my sister had a stroke, uh, pretty severe, she's paralyzed on her whole left side, and uses a walker, and, um, it's affected her memory terribly. She's still able to do some things, but she needs a great deal of help, she doesn't get out without help. She has 12 hour nursing care every day. Um, and her sons pick up, uh, the slack, at night and on weekends. Um, so, let's just say that that has been the hugest motivator to my health-…of anything, because I know with that there for me, I know what I can lose, what I- what could become of me.

Discrepancies Within Themes

Aspects of identity. In the theme, *Identity*, four of the participants clearly identified as "a fat person." In contrast, P2 identified himself with his intelligence, and saw his weight loss as a "hard, hard problem to solve." The expression, "I'm a fat person" did not occur in the interview. He emphasized his identity as someone who solves "hard, hard problems" rather than as being a "fat person."

P5 described herself as a "thin kid," "active," "tomboy." So, even though she did see herself as "fat," the difference was in her emphasis on the identity of physicality and strength. "I've always seen myself as strong."

Motivation to lose weight. In response to questions about motivation over the course of the weight loss journey, P2 stated that "it was always about health." This was in contrast to the other five participants who identified appearance or vanity as the earlier motivations for the most part. P3 (P2's mother) also identified a reason other than vanity for one of her weight loss cycles (to meet a weight requirement for an insurance she wanted to purchase), but this is also more consistent with an externalized motivation rather than one that is internally sourced (e.g., "my own health").

The initial decision to change behaviors for most participants seemed to be at least in part an introjection orientation. That is, weight loss is driven by a desire for greater acceptance and feelings of shame for being "so fat." Given the references to shame, hiding behaviors or consequences of behaviors (avoiding others after weight

gain), it is assumed the reference to vanity by participants is associated with “looking good” for others.

Elements of the journey. The categories and resulting themes converged around what it means to be in healthy weight maintenance. However, an important part of the narrative was “how it was” before the current successful effort began. The common element was the struggle with eating for reasons other than hunger.

Common reasons for eating other than hunger may include but are not limited to enjoyment of the food, boredom, coping with strong (joyous or distressful) emotions, and binge eating. While participants made reference to these patterns, no specific pattern was revealed as a common theme among the six participants. While most of the participants made reference to eating at times for reasons other than hunger and nutrition, **“e**motional eating” was identified by only two of the participants, with a third linking binge eating to emotional eating.

> P4: …to cope with emotions of boredom with things like this…
>
> P5: I mean I've- I go through a few months- sometimes I'll go a month or two where I gain a pound or something like that and then I lose a pound or two or three and in the end it's going down, and, um, and it's going down slowly. If I have like this last couple months, which have been really hard for me, um, where I've been emotionally eating a little bit too much, um, instead of yelling at myself and saying, “You know better. How could you

do that? You're just doing blah, blah, blah," this nasty talk that we do to ourselves-

Three of the participants referenced an episode of binge type eating in their narratives. It is assumed that the narrators are using the terms "emotional eating" and "binge type eating" informally and not clinically, that is referring to eating when emotions are uncomfortable (emotional eating) and engaging in the consumption of large amounts of food in one sitting (binge type eating).

P4: And then… I must've gone on a real binge, because in 1992 when I went back to Weight Watchers, in January of 1992, I was 201.

P5: Um, so back to college, in college when I, I would– I started off, you know, I binged on the Snickers bar. I ate all kinds of food in the dining hall… pick the ones that had fallen off the tree on the ground and I'd cut them, 'cuz, you know, they were untreated, so if one of them were wormy, and I'd cut them up and get the good parts out, and I was eating lots and lots and lots of apples, and my roommate was cooking apple pies and apple cakes and apple everything, and I got to the highest weight I had ever been, which was 178.

P6: and, um, I ate, I know that now today, I know that this is emotional binging, because, um, I have grown up, uh, witnessing fairly abusive relationships, uh, quite abusive actually, between… (family members) … where he, um, was violent, and, um, I, um, I was terrified of him, and I knew my mother, to try and

> help them out, had invited them to come and live with us, and, um, uh, it was pretty, um, pretty abusive, and I know I'd eat, I began eating, um, and so that when I was married, one of the first things I said to my husband was, um, if you ever lay a hand on me, I'll walk. And, um, I had in my head that we should never fight… And so that began the tremendous comfort of food…

Utilization of therapy, providers, and structured support were described as tools to change the behavioral response of eating for reasons other than hunger. During the interview, the narrators also referred to reasons such as a family culture that promoted cleaning one's plate, eating as a social activity, and eating for the enjoyment of the food.

Weight cycling. The chart below provides a visual representation of the difference in each participant's journey, which do not necessarily correspond to the thematic analysis but nevertheless had explicit meaning to the participants. Some had numerous weight cycles, while others had relatively few.

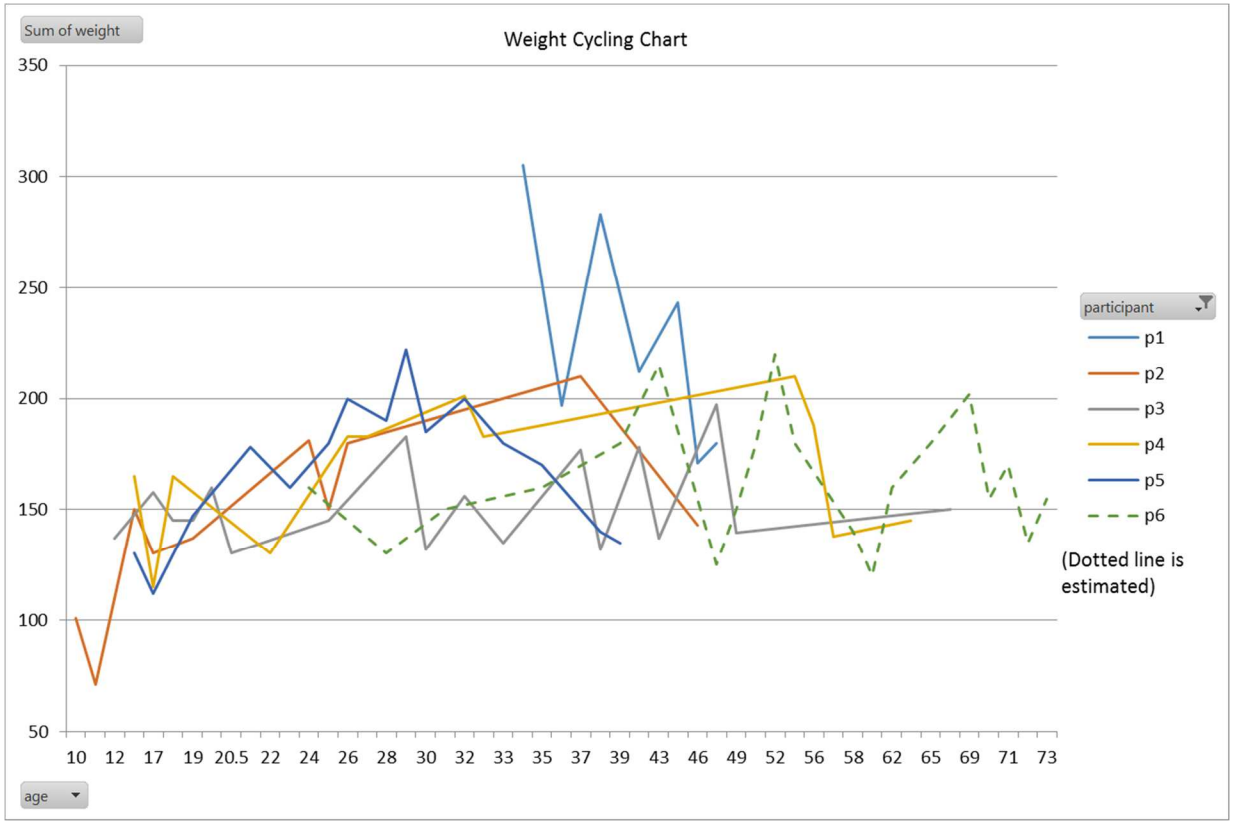

Figure 3. Weight cycling chart

Participants varied in their patterns of weight cycling. P1 has had three major weight loss cycles. His highest weight was 307, with an initial weight loss to 197 over the course of 13 months. He regained to the 280s, pursued lap band surgery, dropping to 212 lbs. He regained to the 240s, and after learning of his wife's potentially terminal diagnosis of lymphoma, dropped to 175, but is maintaining a stable weight of about 180.

P2 described four major weight loss cycles. At the age of 10, he dropped from 101 to 72 lbs. He regained the weight over middle school and in high school began eating the same as his diabetic girlfriend. The estimated weight cycle is 150 to 130. His weight

increased to 180 in college, he dropped his weight to 150 by age 25, gaining back to 225 at his peak weight around the time of his divorce—however, he was at 210 for most of that peak period. The final round he brought his weight down to 135 for "about 12 seconds" and states his current stable weight as 143.

P3 described three rounds of 40 lbs or more weight loss, with additional cycles of approximately 20 lbs. Her first round of 40 lbs down started at age 29 with a weight of 183 down to 130 by age 30. Her second round was at age 37 from 177 to 132 by age 38. Her final round was at age 48 with a peak weight of 197.5 down to 139.5 by age 49. Since age 68 she has hovered around 150.

P4 had three weight cycles of a 20% or more weight loss. She weighed 165 at 16, 115 at 17, 165 at 18, and dropped to 130 at age 22. At age 32, she weighed 201, holding steady until age 55 where she peaked at 210 and began another round of weight loss. By age 57, she was down to 138 and has been hovering around 145 since age 63.

P5 started her journey at a weight of 130, dropping to 117 by age 17. She weighed 178 at age 21, dropping to 160 at 23, then cycling up to 222 by age 29. Over the next 10 years, she gradually lost weight with occasional minor regains until she weighed 135. She described her current weight as 10 lbs more than her mother's but the same size clothing.

P6 reported numerous cycles of 40 lbs as well as at least 6 that were 20% of her highest weight at the time. At age 24 she weighed 160, dropping to 130 by age 28. It was during this time (age 28-43) she had a number of 40 lb weight cycles.

> P6: And that cycle was to remain with me until 1984 and during that period of time I did things like Weight Watchers, I did Atkins, I did Stillman's, I did Diet Workshop, I did, um, fasting, uh, I was never very good at that. Um, I did the kind of thing where I would buy frozen meals to count calories and allow myself, you know, a Snickers bar, as long as it was within the calorie content. Um, you know, yeah, and I did the cabbage soup diet, I think there was one- I don't know if that's what it was called, but that's what I did.

At age 43, she weighed 215 and by age 48 she weighed 125. At 52, she weighed 220, dropping to 120 by age 60. At 69, she weighed 202, dropping to 155 by age 70. At 71 she was back up at 170, dropping to 135 by age 72. She has been hovering around 155 since age 75. (Though she did not lose 20% of her highest weight between age 71 and 72, many experts would acknowledge the difficulty for a woman over 70 to lose this much weight in a year.)

Evidence of Trustworthiness

As described in Chapter 3, Guba and Lincoln's (1985) and Shenton's (2004) guidelines for managing trustworthiness were followed to establish credibility and transferability. The open-ended questions allowed participants to freely share their experience, and provided rich, thick descriptions for the thematic analysis.

Prolonged contact with the participants enhanced trustworthiness. All of the participants engaged in a pre-screening where we discussed the criteria of the study. During that time, some facts about their journey as well as my professional and academic activities were shared. The interviews ranged from 60 to 90 minutes, and additional communication took place via email with some of the participants. All but two participants reviewed a summary of their interview for accurate comprehension of their story.

Transferability has been enhanced by providing rich descriptions of phenomenon, codes, categories and themes; the sampling procedure and resulting sample; the data collection procedures and context such that the reader may understand and make inferences to circumstances in her/his own sphere (Creswell, 2007; Shenton, 2004). I made every effort to provide (a) detailed descriptions to contextualize the phenomena of weight maintenance in terms of the participants' stories and backgrounds, and (b) supported the choice and description of themes with quotes and detailed discussion so that the reader has sufficient material from which to draw meaning.

Verification of the coding process and thematic analysis included use of the audio recordings, and audit trails of the recruitment, interview, follow-up, and data analysis process. Additionally, the use of notes de-briefing each of the interviews helped to identify potential bias and preconceived notions.

Results

The central research question of this study is: What do the narratives of the formerly obese reveal about weight cycling and healthy weight maintenance? As a multi-layered experience informed by physiological, mental, emotional, and social forces, the narratives have revealed themes that represent how these individuals found their way to a sustainable weight loss through adherence to a health program specific to their strengths, preferences, and challenges. The sub grouping by orientation (data, lifestyle, spiritual) suggests that these individuals found a way to create a tailored, person-specific approach; the common themes suggest that regardless of program style, there are shared meanings in the journey to sustainable weight maintenance.

How Does the Narrative Start?

Across all participants, the common starting point that emerged was awareness. Whether in relation to a life-changing event or simply an awareness of size or relationship to foods, participants were able to identify an initial turning point recognizing the problem.

What Are the Turning Points in the Journey?

Major life changes such as college, marriage, and divorce were recurring events among participants that corresponded with weight gain. Going off to college afforded more freedom around food, less activity, and provided more stress. Marriage related weight gain appeared to be informed by a change to a more sedentary lifestyle and lack of

knowledge regarding nutrition. Divorce was described as a "difficult time," "rocky time," and "definitely emotional upheaval," revealing the role a negatively stressful event may play in weight cycling among members of this population. The health crisis turning point was the most recent turning point prior to sustained weight loss for all participants.

It was interesting to observe the role of travel in some of the participants' lives. Trips to Germany resulted in significantly lower calorie (1000 < cal per day) consumption by more than one participant. Trips to Hawaii revealed either significant weight gain over the vacation or cycling between trips.

The final turning point for all of the participants included a health crisis. The medical data (triglycerides, blood sugars, liver enzymes, etc.) and corresponding physical symptoms triggered a strong emotional desire for a healthier lifestyle. Fear of loss – of vitality or life itself – triggered action.

What Is the Meaning of Repeated Efforts?

Generally, repeated efforts were those instances where the individual lost 20% of their highest weight (at the time), with the exception of one participant, whose journey paralleled others except that her weight loss was limited to 20% on one occasion, 14% on two occasions and roughly 10% on others. Older participants revealed more repetitions, with as many as 20 smaller weight cycles over the years for one and six specific rounds of significant weight loss for another. The initiation of another effort was associated with the awareness that (again) their weight was "so far out of control." Thus, the initiation of

the first weight loss attempts and subsequent attempts vary by type of event, but have a shared meaning of "awareness" and "need for action".

How Is the Self or Identity Described?

The response to this question was described by most participants as some variation of "fat." Themes of a dual identity emerged: a lighter self or normal weighted self and a heavier fat self. This duality seems to allow for congruency of behaviors with identity, resulting in sustained mindfulness around identified successful interventions (eating, exercise, ongoing consistent engagement in a structured program) when connected with the lighter/normal weighted self. Other aspects of identity were unique; and included traits associated with competence ("meticulous, solving hard problems," "strong") or the spiritual ("a spiritual being who sees God within self and others"). The narratives suggested that the fat self would return with the resumption of unhealthy behaviors and the failure of the participant to engage in healthy practices.

What Are the Meaningful Sources of Support?

The participants sought to identify individuals with whom they felt connected to and who provided positive feedback through words or actions. Unanimously, participants identified individuals in their lives who support their respective lifestyles to maintain a healthier weight. Participants identified friends with shared interests and health values, as well as family members (spouses, children, family of origin). Sources of friendships ranged from childhood history, to shared interests, or shared participation in a structured

program. Support from family members varied among participants from very little to the primary source of meaningful support. This suggested that the presence of support was more important than its source. However, lack of support or strong negative emotions from one's spouse was identified as problematic in some of the participants' histories.

What Is the Present Moment of the Narrative?

All of the participants expressed gratitude at this time in their lives. Each participant has found positive relationships and the desire to remain healthy for reasons other than self-esteem or acceptance by others. Additionally, each participant expressed cautious optimism for the future.

All of the participants expressed the belief that potential for regain is a permanent condition, one that would require eating a certain way to maintain weight loss and that certain foods were just not worth eating. However, eating off plan once in a while was not the "end of the world," but rather something to pay attention to and treat as an anomaly. Certain foods were identified by some participants as problematic. Hence, for those participants certain foods were avoided. Perhaps what stood out the most was the positive energy in each interview. Participants were open, excited to share their stories, and interested in the potential for helping others.

The discrepant case, P5, presented a journey that was very similar in a number of ways to others with greater percentages of weight loss. She was discrepant both in her identifying as a "strong person" as well as "fat," and her lower percentage of weight loss

and weight cycling. She indicated she thought she was larger than she was, which may have explained her strong desire to reduce her weight multiple times. As the intention of the study was to understand the journey of chronic weight cyclers who have lost and regained a significant amount of weight, 20% weight lost was chosen as part of the criteria with the intention of exploring a treatment resistant condition. Her story provides an example of slightly lower percentages with very similar turning points and behaviors as the other study participants. In fact, her intervention of choice is matched with P6 who reported having lost 20% or more at least 6 times with additional numerous bouts of 40 lb weight cycles.

Summary

Chapter 4 described the results of the data collection process, the analysis and interpretation of themes derived from the transcripts of the participants, as well as distinct differences in their stories, and participants' demographics. Processes to support trustworthiness were explained. Finally, themes relevant to six chronic weight cyclers were revealed and may provide insight about the meaning of healthy weight maintenance.

As much as possible, narrative arcs were organized in response to the following questions: What are the "turning points" in the journey? What is the meaning of "repeated efforts?" How is the "self" or "identity" described? What are the meaningful "sources of support?" What is the "present moment" of the narrative?

Primary themes, some with sub-themes, were identified: structure, strategies (for maintaining food and exercise/for maintaining honesty with self), relationship as support, autonomy/partnership of the program, and identity as a fat person were presented and will be discussed further in Chapter 5. A comparison to previous literature and how the findings confirm, disconfirm, or extend knowledge in the discipline, how the findings align with the theoretical framework, limitations, and recommendations will also be discussed. Finally, the potential for positive social change based on the study will be explored.

Chapter 5: Summary, Conclusion, and Recommendations

The purpose of this qualitative study was to explore key events and experiences in the lives of former weight cyclers who maintained significant weight loss for at least 2 years after multiple attempts. A narrative analysis was conducted to capture the life stories and key moments that contributed to and challenged participants' ultimate success. The central phenomena explored were weight cycling and sustained weight loss/healthy weight maintenance. I explored the themes emerging from the stories of weight cycling, the barriers to weight loss, and the experience of weight maintenance.

Codes that led to the development of categories include the following: Achilles heel, adjustments to routine, apples, corn sugar, alcohol, binge type eating, compulsion, fat, food, food anxiety, food plans, hiding, the phrase "I'm a fat person," identity, intimacy/sex, obsession, program, protective patterns of behavior, restrictive eating, self-aware, strengths, therapy, thought patterns, and tools. The categories under each theme that were developed from the codes included the following: adjustments to routine, plans/program, tools (structure); maintaining food and exercise, maintaining honesty with self, food plans/programs, awareness/strengths, thought patterns/tools (strategies); attending programs with others, the role of relationships, motivation before and after (relationship as support); therapy, protective patterns of behavior, self-aware (autonomy/ownership of the program); and "I'm a fat person," identity, thought patterns (identity as a fat person).

Five primary themes emerged from the categories: structure, strategies, relationship as support, autonomy/partnership of the program, and identity as a fat person.

P5 was identified as discrepant case in her history of weight loss because she identified herself as a "strong person" as well as a "fat person" and did not have the broad swings identified in the original criteria for the study, despite having a very similar behavior set as others who identified as a "fat person" and had much broader weight cycles. She was included due to her similarities in behavior, thoughts, and narrative arc as participants who gained and lost greater percentages of weight on more occasions.

Although she lost 14% of her highest weight (at the time) on two occasions, and 10% of her weight many times, she was only able to recall a weight loss of 20% of her highest weight one time. Her journey and turning points were consistent with others who had lost a higher percentage of weight. Also, in the telling of her story, it appeared that the first time she lost 14% of her weight, in Europe, she became very lean. She explained that she had stopped mensing during this weight cycle, and the degree of weight loss left an impression: She would always monitor her calorie restriction so that she would not replicate the vacation in Europe. Subsequent weight cycling of 14% occurred on two occasions until the final turning points.

P5's identity as a fat person was not discussed in the interview. Three decades ago, neither BMI nor body fat percentage were common measures for "fat." The notion

that a young woman of 5'2" could weigh 130 lbs (a BMI of 23.8) and be very healthy was contrary to the cultural messages of the time. During the 1980s and 1990s, BMIs for super models were running in the mid to upper teens, providing an unrealistic standard for health and beauty to young women of that era. Thus the effort to lose weight was there, perhaps because of the contextual beliefs and attitudes about weight during her most impressionable years.

Interpretation of Findings

Comparison to Published Research

The physiology and biochemistry of weight loss. Participants described to varying degrees physical and psychological attributes that may have made sustained weight loss difficult for them. References to family history of obesity, less than optimal physiology, and injuries were some of the issues participants worked through in their weight loss journeys.

Most of the studies published on obesity have focused on the physiology of weight loss. These include studies of hypothalamic injury (Nishizaw & Bray, 1978; Wang et al., 2007), genetic vulnerability (Bouchard & Tremblay, as cited in Parker-Pope, 2011), and the role of monoamines in weight gain and loss (Rothman et al., 2008). Other factors such as psychological traits (Elfhag & Rössner, 2005; Granburg, 2006; Williams et al., 1996) and psychological conditions such as PTSD (Brewer, 2010; Dedert et al.

2010,;Vieweg et al., 2006), ADHD (Cortese et al., 2007), and depression (Murphy et al., 2009) have been studied for their role in weight gain and weight cycling.

The participants in this study spent years mastering the art of weight loss, and found their way to sustaining the weight loss via a newfound value of health and longevity. Likely, genetics, disrupted metabolism, and possibly disrupted monoamines were factors in some participants' journeys. What this study indicates is that each participant created a personal commitment to find a way to stay on a self-designed program (with varying degrees of help designing the program) that they found to be effective in meeting their health goals. If participants discovered a food or pattern that undermined their health goals, they made an adjustment to their behavior. Participants described vulnerability to both physical and emotional effects of certain foods. Although certain foods lost their appeal as dietary practices shifted, there was a willingness to reject the problem foods identified regardless of the pleasure associated with those foods.

Only a few participants referred to emotional eating as part of their journey. There were other references to chaos and interpersonal dysfunction in the lives of some of the participants. Although Brewerton (2010) suggested these experiences may impact both physiology and susceptibility to a stronger response to food in the brain and in the body than individuals who have not had such experiences, my study did not reflect this as a major theme among participants. I could not determine whether such experiences were

influential in participants' weight journey because the focus of the study was on their success.

Weight loss interventions. Efforts at weight loss using a pharmaceutical approach were reported as helpful by one of the participants. However, it was combined with hypnotherapy and a specific weight loss diet (South Beach), so it is difficult to identify a single intervention that worked for this individual. Lap band surgery was used by one of the participants but was described as a "failure." Weight Watchers was the most widely used program; most participants used it at some time in their journey. Two participants appeared to find Weight Watchers useful as a guiding principle for food choices. These results suggest that there is no "magic bullet" to apply, which seems contrary to medical efforts to isolate specific interventions for effective treatment. For example, pharmaceuticals target the biochemical processes, although most have been demonstrated to have adverse side effects (Powell et al., 2007). Surgical interventions are used to target the patient's capacity to consume large amounts food, but the majority of postoperative patients regain some or all of their weight (Ochner et al., 2011; Powell et al., 2007).

Behavior modification. None of the participants reported use of a formal behavior modification program. Rather, participants developed their own programs with varying degrees of professional support to modify nutritional intake and activity levels. Most of the participants referenced a psychological component in their journeys. Some

used counseling specific to weight loss; others simply referenced therapy as a resource to deal with challenges in their lives and get past experiences that were painful. A couple of the participants used therapy to change automatic thoughts regarding food. It appeared that therapy helped them identify healthier ways to reduce problematic behaviors and helped them learn healthier ways to cope with difficult experiences. A few of the participants referenced the term "emotional eater" when describing their behaviors in the past. In addition, a couple of the participants described working through identity and self-esteem issues in therapy.

Behavior modification programs generally include a multidisciplinary approach educating clients in the areas of nutrition, exercise, stress, environmental influences, and emotional influences. The studies have been difficult to assess due to variance in the models, duration of the programs (usually 6 months) and duration of follow up (Angemayr et al., 2010; Latner et al., 2000). Participants in this study designed their own programs, informed by experts from multiple disciplines and personal experience. Unlike behavior modification programs implementing a standardized package of information and tools, participants found through trial and error acceptable food plans that worked for their lifestyles, exercise programs that fit their preferences, and/or could accommodate sometimes unpredictable limitations such as injury or child care. Most participants referred to counseling, potentially educating them to the emotional and environmental influences associated with recurring weight gain.

Perhaps just as important as the method to maintain weight is the element of designing and choosing one's own plan. Behavior modification programs include a principle of self-efficacy (Bandura, 1977, 2004). The Trevose model (Latner et al., 2000), seen by some as the "opportunity of a lifetime," also requires a high level of commitment for participants: a 15% weight loss prior to admission and 100% attendance once admitted.

Participants in this study demonstrated high levels of self-efficacy as they shared stories describing their respective searches to find effective methods to sustain weight loss. Though not stated explicitly, the stories suggested an attitude of "I need to find what works for me." Participants also demonstrated a persistence and commitment level to health that may be one of the most relevant aspects of the Trevose model.

Social-psychology factors. Identity was strongly associated with being "fat" by most of the participants. Bandura (2004) and Granburg (2006) explored the challenges associated with identity and congruent behaviors. A behavior's congruence or dissonance with identity and values may play a role in sustained behavior change (Bandura, 2004). Overemphasis on body image was identified as a poor predictor of sustained weight loss (Collins et al.; 1983) and aligned with the congruency and idealization elements Granburg (2006) referred to. If a person self-identifies as "fat" or "not really an exercise person," engaging in behaviors to make them "un-fat" may be too uncomfortable to maintain, or they may simply revert to behaviors that keep them stuck in a cycle of

unhealthy behaviors. Most of the participants spoke explicitly of the duality of the fat self and the lighter self and the social stigma associated with being large. Issues of shame for being fat and for poor performance (not eating properly) were described by most of the participants.

Salter (1980) identified a correlation between weight loss and stated intentions and beliefs regarding what others expected of the participant in the program. In Salter's study, participants surrounded themselves with individuals who believed in their success. Benyamini and Raz (2007) noted a relationship between participants' confidence (expectations) in attainment of weight loss goals and actual weight loss. However, Benyamini and Raz were unable to identify whether the confidence was due to environmental or internal factors.

Participants in this study had a lifestyle similar to those cited by Kruger et al. (2006). They had a weight loss goal, physically active lifestyle, and regular meals with breakfast daily. These elements were associated with higher rates of sustained weight loss when Kruger et al.'s group analyzed data from the National Weight Control Registry (*N* = 10,000+). Kruger et al. also found 20% of the successful sustained weight loss participants reported weight training as part of their health regimen. Participants' stories from my study appear to align with this facet of Kruger et al.'s study, although it was unknown how often my participants engaged in weight lifting. Stories were for the most

part described in terms of weight loss goals. All participants described physically active lifestyles relative to their same-age peers and regular meals including breakfast.

Other practices observed by successful weight loss participants in the National Weight Control Registry were regular breakfast, attention to nutrition, attention to activity, and self-control over food intake (Elfhag & Rössner, 2005). These practices aligned with participants' stories in my study. Each participant used different methods to maintain control, but all were committed to maintaining limits regarding portions and problematic or trigger foods.

Sustained motivation may be one of the more challenging elements of a successful health program. Studies using external motivation have not resulted in more positive outcomes (Meyers et al., 1996; Mavis et al., 1996). All of the participants spoke of a shift in motivation from external or appearance oriented to internal (i.e., one of greater health and greater functionality). The desire to be at a healthier weight was associated with a desire to maintain strength and vitality for a longer, more active life.

The EPODE project conducted by Katan (2009) demonstrated a nearly 10% reduction in childhood obesity by taking a community approach. In this study, participants were involved in multiple communities supporting and providing opportunities for better food choices and higher activity levels than previously when weight cycling was a struggle.

Saks (cited in Katan, 2009) assessed the best approach, comparing low carbohydrate and low fat food plans for weight loss. Saks found such a high rate of noncompliance by participants that no relevant comparison of food plans was possible. Saks suggested that it is unrealistic to expect those with less resources (well-educated, higher income) and higher need to do any better. In contrast, participants in this study has managed to maintain compliance to a sustained weight loss program using a variety of food plans, personal planning, and social support.

The positive outcomes of the EPODE study when compared with Saks' study suggested treatment is more complex than a randomly assigned lifestyle program, regardless of participants' health: physiological, psychological, emotional, and/or spiritual. In this study, the diversity of programs participants committed to appeared to suit their distinctive strengths and problem areas. The participants appeared to have discovered or developed their programs after numerous attempts which may be viewed as an ongoing experiment to discover the relevant variables in each person's struggle with sustained weight loss. One might say that implicit in the many attempts to lose weight, the participants were trying to find a program that "fit" their individual health and social needs.

It may be important to recognize that the material, psychological, social, and intellectual resources available to these participants are likely greater than the average U.S. citizen. Participants' stories aligned with diverse studies emphasizing different

aspects of the journey. Factors that appeared relevant to these six participants were the culture, supporting Salter's findings on expectations (1980), and the EPODE projects, a healthy motivation for sustained health promoting behaviors (Deci & Ryan, 2008, 2013), modeling and vicarious learning (Bandura, 1977, 2004), and healthy adjustment to the new identity associated with the lower weight (Festinger, 1957; Granburg, 2006; Rogers, 1961).

The quantitative research findings have examined an array of variables informing both weight gain and weight loss, yet they preclude any firm generalizations for individuals who weight cycle 20% of their highest more than once and demonstrate sustained weight loss for two years or more. In contrast, the results of this study suggest that narratives may open the door for exploring the motivations and barriers (physical, mental, or material) to sustained weight loss among 20% weight cyclers.

Big 5 personality traits (openness, conscientiousness, extraversion, agreeableness, and low neuroticism) have been associated with better health, better response to treatment and lower illness and mortality rates (Taylor, in Woble, Labbe & Cochran, 2013). The participants included in their narratives different methods for reducing feelings of sadness or anxiety (neuroticism) to improve quality of life. Participants in this study appeared in the present to demonstrate a persistent willingness to try new things and experiment with a variety of interventions (openness), value driven behavior (conscientiousness), high levels of agreeableness, sociability, and when appropriate, the use of therapy or a strong,

semi structured support system to deal with emotionally charged experiences (potentially reducing neuroticism).

In their exploration of spirituality and its relationship to health resilience, Womble's group (2013) found two of nine predictor variables correlated with 43% variance in a health resilience score using Sideroff's Resilience Questionnaire (2004, cited in Womble, et al., 2013). The two variables were spirituality and neuroticism. Spirituality was measured using Sideroff's Relationship with Something Greater Scale (2004, cited in Womble, et al., 2013). Questions included: I find purpose in my life; I am committed to giving service; I have a hard time sticking to my commitments; I have a basic enjoyment and love of life. Participants in this study are assumed based on their narratives to score high on this Scale. All spoke of meaningful endeavors and relationships, many were actively volunteering in some capacity, demonstrating follow through on professional and personal commitments (family, parenting, commitment to groups).

Alignment with Theoretical Framework

SDT. The focus of SDT explains the difference between intrinsically and extrinsically motivated behaviors (Deci & Ryan,2002; 2013). The five components include cognitive evaluation theory, organismic integration theory, causality orientations theory, basic psychological needs theory, and goal contents theory. Autonomy is a cornerstone of the theory. Autonomy is generally defined as acting separately from

others, or self-governing. Autonomy orientation in SDT states that the source of motivation to pursue an action derives from the pleasure or valuing of the action rather than a secondary reward for doing so (Deci & Ryan, 2008).

Cognitive evaluation theory explores how rewards, social relationships and identity affect intrinsic motivation and preferences. Participants described a shift in their thinking on the last round of weight loss. Across the board, they indicated that awareness of poor health, shorter life span, and greater pain were associated with continued obesity. They identified a desire for greater quality of life, an opportunity for more time and more enjoyable time with family members, and a history of persistence and a belief in the ability to achieve goals through one's efforts. As one reviews their narratives, a recurring theme for most is the recognition that greater health can be achieved through a specific set of behaviors.

Organismic integration theory explores the ways in which extrinsic motivation is internalized by examining the type of motivation associated with a behavior. Moving from least to most autonomous, the types of motivation are external, introjected, identified, integrated, and intrinsic. While external rewards are not internalized at all with external regulation, they are fully internalized with intrinsic regulation. Rule following to avoid consequences may exemplify this level of motivation. Introjected regulation is based on contingent self-esteem and may be highly relevant in the weight loss journey. Moving to identified regulation, the individual begins to connect with the values

underlying a certain behavior that is shared with others in his community or culture. Integrated regulation may be best exemplified by performing a career one loves but that one would not do simply for the pleasure of doing it. That is, payment or some other reward would need to be present to drive the behavior. Purely intrinsic regulation is the desire to perform the behavior simply for the pleasure or interest in the activity.

Participant revealed an increasingly intrinsic approach to behaviors associated with weight loss over the course of their respective journeys. As a child, behaviors may have nothing to do with weight loss per se. Playing actively for the fun of it, dancing, participating in physically demanding activities such as high school plays all were likely driven for the desire to enjoy the activity for its own sake. The initial decision to change behaviors for most participants seemed to be at least in part an introjection orientation. That is, weight loss is driven by a desire for greater acceptance and feelings of shame for being "so fat." The motivation labeled "vanity" by participants is likely related to increased acceptance by others, given the identity issues associated with lowered self-esteem as weight increases.

It is unclear what orientation was in play for participants when they engaged in weight loss behaviors (restricting calories) as children. Were they simply going along because it was asked of them, were they embarrassed by their weight as a child or were they pursuing health for health's sake? Likely, motivation regulation varied in relation to variables in their lives such as self-esteem, social norms, and more. Those with childhood

obesity spoke of the discomfort associated with being the largest or one of the largest children among their peers. When weights reached new highs, or regain occurred, descriptions of hiding from others who might judge them were common.

The participants worked through self-esteem issues associated with weight in various ways and with varying levels of resolution. All of them found activities and foods they can enjoy, though it appears if it were not for the resulting physical and/or social benefits of many of the activities, they would not perform them (integrated regulation).

Causality orientations theory seeks to explain differences among individuals' tendency to experience reinforcement via different types of rewards. Subdivided into three orientations, autonomy, control, and amotivated, the theory states that an individual motivated by the pleasure or specific reward associated with a behavior is described as having an autonomy orientation while an individual acting to receive rewards or approval is described as having control orientation. The amotivated orientation presents with a lack of confidence in competence. Participants in this study appeared to find activities they enjoyed for their own sake that also supported a weight loss goal. For those who reported a history of performing for acceptance or reward, the move away from a control orientation seemed to enhance participants' success.

Sustained efforts associated with weight loss often include physical discomfort. To continue with the activities solely for the purpose of losing weight or maintaining a sustained weight loss would be taxing. Participants have described receiving

compliments for weight loss during the process of dropping the weight, but the compliments subside as weight loss is maintained. All participants were able to identify multiple elements of their programs which they found pleasurable. Most participants described great enjoyment in the physical activities, foods they currently eat, social settings where they engage in sports, dance, swimming, etc., and planning their meals. To a lesser extent some participants took great pleasure in tracking and analyzing their programs for efficacy.

Basic psychological needs theory examines the effects of support (or lack of it) on psychological needs. The needs for autonomy, competency, and relatedness must be supported to promote psychological health and the absence or opposition to meeting those needs adequately results in maladjustment. All of the participants demonstrated autonomous stance within their weight loss journey as well as other areas of their lives. Competency across multiple domains was demonstrated time and again as participants told their stories. They all described journeys which included important loved ones. Participants' ability to adjust their behaviors to reach their desired goals may be informed by the support for their basic psychological needs.

Goal contents theory examines the relationship of intrinsic and extrinsic goals on psychological well-being. The theory states that intrinsic goals such as community, relationships, and personal growth lead to greater overall well-being than the pursuit of extrinsic goals such as money, beauty, or fame. The participants' focus on community,

relationships, and personal growth varied, but was present in every narrative. Participants found joy in serving their community, families, and the pursuit of new skills and knowledge.

Though level and type of community involvement varied, all had membership in multiple groups. Whether it was church, an organization focused on healthy weight, or a sports/activity based group. Additionally, meaningful relationships such as marriage, family of origin (siblings/parents), children, and long standing friendships were described by all of the participants. Personal growth occurred via counseling for at least five of the participants, but more notably they all expressed an openness to learning and new experiences.

The participants demonstrated overall positive psychological adjustment as described by SDT which may have given them an effective foundation to pursue sustained weight loss for reasons that would not be undermined by external forces. With a healthy foundation, they have been able to persist in their efforts and maintain a positive outlook.

SCT. Bandura **(**1977; 2004) suggested that intrinsic motivational focus may have substantial impact on the success of health behavior outcomes (Vansteenkiste, et al., 2004). This is similar to SDT's goal contents theory.

In addition, SCT addresses how goals are impacted by self-efficacy and barriers and/or facilitators in the environment (Bandura, 2004). Self-efficacy will inform one's

belief in positive outcomes for effort expended. To the extent one believes they may bring about the desired outcome, one will put forth effort in reaching the goal and overcoming barriers. Perceived pleasure or discomfort associated with the behavior necessary to achieve goals as well as expectations of material loss or gain play a role in outcome expectations (Bandura, 2004). Participants expressed pleasure associated with a number of activities useful in bringing about desired outcomes, and an acceptance of some of the less pleasant activities required.

Social acceptance or rejection (stigma) also informs behavioral choices (Bandura, 2004). Perhaps most relevant to SCT's role in healthy sustained weight loss is the decision of participants to create a culture supporting healthy choices. Participants were involved in communities who promoted athletic performance, healthy eating, and healthy psychological practices.

Limitations of the Study

Transferability is the ability of the reader to apply the study findings to other settings (Lincoln & Guba, 1985). The researcher used the technique of rich, thick descriptions in order to provide sufficient information about self (i.e., role of the researcher), context, participants, data gathering and analysis process, results and interpretation. It is hoped that this level of detail will facilitate the reader's identification of commonalities across similar and dissimilar contexts and individuals (Morrow, 2005).

As stated in Chapter 4, my plan was to reach out to organizations outside the northwest if there were a shortfall of participants or saturation had not occurred at 12-16 participants. However, the efforts to engage and follow up with the original plan took almost four months. The unwillingness of colleagues and programs to participate and lack of response from direct recruiting methods resulted in the decision to stop data collection at six participants. The lack of response by potential participants and potential referral sources may have revealed a distrust that would discourage participation in research, lack of interest, or time. With respect to specialists in the field of weight loss, I wondered if some were concerned that a poor turn out of potential participants from their organization could reflect poorly on them or the organization serving chronic weight cyclers in the obese and morbidly obese categories.

It is unknown if my professional role as therapist with a sub-specialty in treating chronic illness including chronic weight cycling influenced potential participants to reach out for participation in this study or not. This information is accessible via my online presence as a private practitioner.

Narrative analysis is actually comprised of the examination of two stories: one told by the participant and one told by the researcher (Reissman, 2008). This creates risk for researcher bias, as the researcher is both acting as observer and observer participant. As an observer, the researcher attempts to gather data without bias or influence. Being a participant observer is unique to narrative in that the researcher is influencing her

participants via her responsiveness (verbal and nonverbal) to the participants' stories, as well as her interpretation of the story (Reissman, 2008).

To prevent the researcher from asking leading or inappropriate questions, the interview questions were reviewed by qualitative methodological experts (Creswell, 2007). Open-ended questions were asked. To prevent distortions of data, recording of the interview and participant review of a summary of the transcribed version of interview occurred. Audit trails, rich, thick (detailed) descriptions of the research process, and member checking (the process of inviting participants to assess the researcher's summary and interpretation of the transcript) was used to increase trustworthiness (Carlson, 2010; Zhang & Wildemuth, 2009).

Though family members and friends expressed a desire to be open and share their stories for the benefit of others, it is possible that using a snow ball recruitment approach may have resulted in participants withholding some information because of concerns that other participants may learn parts of their story if they were to read the study in its entirety. Though there was no evidence of discomfort in sharing one's story from any of the participants, it is possible some aspects of the story were not shared due to the recruitment method and fears of sustained confidentiality.

Credibility and Rigor

Techniques for Establishing Credibility

The narrative approach is a well-recognized research method (Clanindin, 2007; Clanindin & Connelly, 2000; Creswell, 2007; Reissman, 2008). I used open ended questions that derived from the literature to promote a grounded approach to the phenomenon. My work with chronic weight cyclers since October, 2007 has been rewarding and educational, providing an excellent foundation for understanding aspects of the participants' stories.

Participants received the identical protocol for the invitation and informed consent, so that only those who genuinely wanted to participate were included. Honesty and engagement were encouraged by building rapport through prolonged contact. The three expected interactions with me were the initial screening, the interview, and the follow up.

In my interview protocol, I used iterative questions and probes to gain details and clarify meanings and to identify discrepant cases and themes. I used my diary as an opportunity to reflect on and record the process and my impressions. Summaries of transcripts were emailed to four of the six participants, returned with minor revisions. Rich, thick, detailed descriptions of participants' journeys as well as setting, data collection and analysis procedures were provided.

Techniques for Establishing Transferability

I made every effort to provide (a) detailed descriptions to contextualize the phenomena of weight maintenance in terms of the participants' stories and backgrounds, and (b) supported the choice and description of themes with quotes and detailed discussion so that the reader has sufficient material from which to draw meaning. I also provided details of the invitation and recruiting process, the data collection methods and tools, the length of the interviews, and the time period of data collection.

Techniques for Establishing Dependability

As described by Shenton (2004), I made every attempt to describe the processes of data collection in detail. Providing a history of the research process, documenting each step of the research, not only provided the ability to assess credibility of the research by the reader as previously mentioned, but also allowed for visibility into my responsiveness to the varied information presented by the study participants (Clanindin, 2007; Carlson, 2010).

Techniques for Establishing Confirmability

Shenton (2004) described confirmability as the steps to ensure that the research findings are the results of the participants' experience, rather than those of the researcher.

"Bracketing" of researcher's background and beliefs associated with the phenomenon of interest was done before beginning the data collection. Incorporating the use of debriefing notes after each interview as part of the audit trail to capture my

observations, beliefs, surprise, or predictability (i.e., reflexivity) was helpful in identifying researcher bias and preconceived notions in the research process. Detailed descriptions of the analysis and interpretation (in Chapters 4 and 5) were done to make the process and results as transparent as possible.

Ethical Procedures

Male and female adults were invited to voluntarily participate in the study via direct passive invitation (Facebook, Twitter, and flyers) and referrals. The informed consent form which includes a statement of confidentiality and consent to audio taping can be found in Appendix C. This form also includes a detailed description of the criteria for inclusion, interview procedures, and resources to contact should there be any experience of distress. Participants were free to withdraw at any time. An alpha numeric combination was used to create a pseudonym for each participant as a substitute for real names. It is recognized that this may minimize the revelation of identities to non-family members. However, because the sample is small and four of the six participants are related, it is likely that these individuals will recognize themselves or each other in parts of the narrative.

Recommendations

Participants' narratives revealed shared traits such as conscientiousness, agreeableness, a persistent willingness to try new things and experiment with a variety of interventions, and sociability. They also identified the use of therapy or a strong, semi-

structured support system to deal with emotionally charged experiences. All of the participants demonstrated persistence over the years to master healthy weight maintenance. These traits correspond with the construct of resilience. Each described a similar catalyst for change and for the most part, a motivational shift from vanity or social acceptance to one centered on health, functionality, and longevity. Future studies can include all of these components in order to more effectively demonstrate how individuals maintain sustained weight loss.

This group of participants revealed three diverse orientations (data, lifestyle, and spiritual) to weight management. Future qualitative research is encouraged to explore the consistency and/or variation of these orientations in order to provide saturation for this phenomenon. Research quantifying these orientations is also encouraged as a way to examine the "fit" between orientation towards weight management and type of program.

Studies exploring commitment and conscientiousness in healthy patients who sustained weight loss may reveal the tools necessary to "carry on" despite challenges that often derail individuals from sustained health practices. The participants in this study revealed the capacity to sustain commitments to others and a high level of conscientiousness in various domains in their lives. Sideroff's model of resilience may offer an interesting vehicle to examine individual differences in resilience, spirituality and neuroticism that distinguish individuals who succeed at sustained weight maintenance from those that do not (2004, cited in Woble, et al., 2013).

Finally, this study suggests that the weight loss journey may be informed by the Zeitgeist of the times. That is, the scientific knowledge, ideas, and beliefs about weight loss and beauty have changed over times. Thus, the older participants emphasized calorie restriction, low fat diets, and "numbers on the scale," which is consistent with regimens of the 1970s and 1980s. Dieting on limited foods was also more common among the oldest participants, P3 (72), P4 (68), and P6 (72). In contrast, the younger participants incorporated exercise earlier in their journeys and discussed their food plans with more emphasis on the nutritional balance (fat, carbohydrate, and protein) of foods. Future researchers are encouraged to further explore the cultural context in which health, beauty, and weight loss occur as a means to better understand the phenomena of weight loss and maintenance.

Implications

Implications for Social Change

Participants described lengthy journeys using popular weight loss methods with results consistent with the majority of obese dieters: eventual regain. It was not until each individual experienced a significant health crisis that they mobilized to create a plan that would work. Each participant addressed personal barriers (physical, behavioral, emotional) to sustained weight loss and found methods to work around or overcome such barriers. Perhaps the most profound implication for social change from this study is the call to professionals and programs to learn how to better "capitalize" on the

crisis/opportunity that obese patients bring with them by framing their circumstance as a "turning point" in a journey that requires the cultivation of self-understanding as well as the learning/relearning of tools and techniques for managing food choices.

The themes revealed in this study suggest that the current focus in weight loss programs fails to take into account the individual stories of the struggle to lose weight. Shifting the focus to promote self-design based on one's circumstances, values, and strengths would likely increase efficacy of treatment by promoting autonomy and ownership regarding one's health. Empowering individuals to design a program or lifestyle based on components that will increase their willingness to "stick with it" may result in a focus away from "losing weight" and a focus towards "better health."

The opportunity to effect social change at the local level includes relaying this information to providers and to individuals struggling with the phenomena of concern. Conducting presentations at local organizational conferences, development of training materials, tools accessible on my website and presentations to local organizations such as Overeaters Anonymous and other self-described groups interested in the phenomena can provide opportunities for individuals to access pertinent data gleaned from the study.

Methodological and Theoretical Implications

The methodological approach used in this study reveals both the diversity of experience contributing to obesity, diverse methods of weight loss, and the diverse array of barriers to sustained weight loss among individuals. The narratives revealed turning

points associated with lifestyle change, identity shifts, family patterns, and personal experiences informed by preferences in focus (data oriented, lifestyle oriented, and spiritually oriented). As the reader learns the participants' stories, one can see the participants' strengths and activities that bring the participant a feeling of success and/or are a source of pleasure, as well as participants' seemingly conscious choice to build on their personal strengths. Thus, the narrative approach provides to the field access to insights that further personal, professional and academic understanding of this issue.

SDT emphasizes a foundation of met psychological needs driving one towards healthy choices. While social context is relevant, the emphasis is summarized by a triad of domains: autonomy, mastery, and relatedness. The participants in this study demonstrated a strong foundation among all three domains. There appears to be a sense of ownership of choice around behaviors, a belief in one's ability to master the problem, and a rich network of relationships informing both desire and a sense of duty to improve one's health. SCT better addresses the process of observing success and placing oneself in successful environments where social norms simplify the process of healthy weight maintenance in this population.

Recommendations for Practice

Mental health **c**linicians working with weight cyclers losing and gaining 20% or more of their highest weight multiple times will want to evaluate the various components addressed in the literature and highlighted by participants in this study. In so doing, it is

important to remain within one's scope of practice. Evaluating the client's mastery of the mechanics of weight loss may require consultations with or referrals to dietitians, personal trainers, physical therapists, and/or medical clinicians such as general practitioners or endocrinologists.

Evaluating for barriers to sustained weight loss related to mental health such as depression, anxiety, ADHD, PTSD, bipolar disorder and personality disorders may be more straightforward. However, the mental health clinicians will provide more effective care to these clients if they are familiar with the physiological effects of the disorders and medications used to treat the conditions.

Evaluation of the environment for support as well as potential triggers for a return to prior behaviors (leading to weight gain) will provide the client a foundation for changing or adapting to unchangeable conditions in his or her world. Further, assessment of the client's levels of autonomy, support system (relatedness), mastery of the tools necessary for success and source of motivation will help with development of a treatment plan. It may be helpful to assess whether traits associated with resilience such as, conscientiousness, extraversion, agreeableness, and low neuroticism are playing a role in the client's adherence to a healthier lifestyle.

If they are not yet in an integrated regulation phase, this study suggests these individuals will not maintain the lifestyle necessary to keep obesity in remission. Exploring the benefits of valuing health for its own sake is necessary, but not enough.

Healing shame and promoting self-worth based on one's own opinion of oneself will reduce the incidence of external stimuli driving unhealthy behaviors.

This small study revealed three distinct styles of organizing and implementing a sustainable food plan combined with essential exercise. In this study, the data-oriented participants emphasized tracking and analyzing, but they differed in their approach to exercise, due to both preference and level of responsibility with children. The lifestyle participants used philosophies from one or more popular food plans, and found exercise they thoroughly enjoyed and had a social component (more highly valued than the other 4 participants). The behaviors needed to "fit" into a lifestyle and had a great amount of flexibility within the monitoring of pertinent behaviors. The spiritually oriented participants emphasized honesty with self and others, community, and calmness in the face of weight change. These styles can be used in practice to help patients self-identify and develop strategies consistent with their individual differences.

Though up-front costs and efforts may be greater, identifying and promoting psychological traits associated with successful sustained weight loss would likely lead to better outcomes, freeing resources (time, money, mental, emotional, and physical energy) devoted to a currently treatment resistant condition.

These participants revealed they were experts at weight loss. Knowledge of healthy eating and healthy exercise is one component of managing the condition. The effort associated with sustained weight loss among formerly obese weight cyclers is

greater due to the metabolic dysfunction associated with obesity and likely additional barriers that vary among individuals. Some individuals may only need to learn the mechanics of weight loss for success, but for those who experience repeated weight gain, the mechanics of losing weight is not enough. Formerly obese weight cyclers may be well served to emulate the professional athletes who learn both the mechanics of their sport and psychological skills to master discipline and performance requirements.

The foundation for sustained change begins with healthy psychological adjustment. However, optimal adjustment may not be required for success. Rather, providing interventions to address barriers to success – such as addressing shame and self-esteem issues associated with obesity prior to a strong emphasis on weight loss behaviors may be healthier and more successful over the long term, as weight cycling has been identified by some researchers as a health concern. (Olson, et al., 2000).

The participants in this study demonstrated mastery of necessary behaviors associated with sustained weight loss that was developed over time. Setting patients up to learn incrementally, building success along the way may be necessary, especially if they lack a history of success in other domains. Participants in this study showed success in other domains (relational, professional, academic) that may have informed their confidence and resiliency on their journeys.

Conclusion

Obesity is a health condition generally treated as a physical malfunction or "lack of will," and too little emphasis has been placed on the mindset and psychological strength required to maintain a fairly regimented lifestyle. The relationship with food, exercise and other health practices may be akin to the professional athlete's regimen and commitment for long term success. Rather than aiming for "normal" lifestyle, success may require extraordinary resilience, persistence, and commitment. Other health conditions require accommodation and an acceptance of the hard work necessary to prevent the condition from taking over the life of the individual.

Generic prescriptions for exercise and a healthy food plan prior to assessing traits indicative of capacity to maintain sustained weight loss lack the necessary precision to promote desired outcomes. This health condition requires a holistic assessment of the patients' lifestyle, skill set, resources, and psychological functioning. Interventions promoting resiliency, autonomy, mastery, relatedness, and environmental resources would optimize the potential for successful sustained weight loss among individuals in this population.

References

ABC News. (2012), Retrieved from http://abcnews.go.com/Health/100-million-dieters-20-billion-weight-loss-industry/story?id=16297197

Abd El-Aziz, T., Mohamed, R., Mohamed, R., & Pasha, H. (2012). Leptin, leptin gene and leptin receptor gene polymorphism in heart failure with preserved ejection fraction. *Heart and Vessels*, *27*(3), 271-279. doi:10.1007/s00380-011-0152-2

Alvarez J., Pavao J., Baumrind N., & Kimerling R. (2007). The relationship between child abuse and adult obesity among California women. *American Journal of Preventative Medicine, 33*(1), 28-33. doi:http://dx.doi.org/10.1016/j.amepre.2007.02.036

Anderson, J., Konz, E., Frederich, R., & Wood, C. (2001). Long-term weight-loss maintenance: A meta-analysis of US studies. *American Journal of Clinical Nutrition*, *74*(5), 579-584. Retrieved from http://ajcn.nutrition.org/

Angermayr, L., Melchart, D., & Linde, K. (2010). Multifactorial lifestyle interventions in the primary and secondary prevention of cardiovascular disease and type 2 diabetes mellitus: A systematic review of randomized controlled trials. *Annals of Behavioral Medicine*, *40*(1), 49-64. doi:http://dx.doi.org/10.1007/s12160-010-9206-4

Appolinario, J. C., Bueno, J. R., & Coutinho, W. (2004). Psychotropic drugs in the treatment of obesity: What promise? *CNS Drugs, 18*(10)629-651. doi:http://dx.doi.org/10.2165/00023210-200418100-00002

Apter, M. J. (1984). Reversal theory and personality: A review. *Journal of Research in Personality*, *18*(3), 265-288. doi:http://dx.doi.org/10.1016/0092-6566(84)90013-8

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1988). Organizational application of social cognitive theory. *Australian Journal of Management, 13*(2), 275-302

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 21*(2), 143-164. doi:10.1177/1090198104263660

Bandura, A., Ross, D., & Ross, S. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology, 63,* 575-582.doi:10.1037/h0045925.PMID 13864605

Benyamini, Y., & Raz, O. (2007). “I can tell you if I'll really lose all that weight." Dispositional and situated optimism as predictors of weight loss following a group intervention. *Journal of Applied Social Psychology, 37*(4), 844-861. doi:10.1111/j.1559-1816.2007.00189.x

Boeka, A. G., Prentice-Dunn, S., & Lokken, K. L. (2010). Psychosocial predictors of intentions to comply with bariatric surgery guidelines. *Psychology, Health & Medicine*, *15*(2), 188-197. doi:10.1080/13548501003615282

Borges, R., Temido, P., Sousa, L., Azinhais, P., Conceição, P., Pereira, B., … Sobral, F. (2009). Metabolic syndrome and sexual (dys)function. *Journal of Sexual Medicine*, *6*(11), 2958-2975. doi:10.1111/j.1743-6109.2009.01412.x

Brewerton, T. D. (2011). Posttraumatic stress disorder and disordered eating: Food addiction as self-medication. *Journal of Women's Health*, *20*(8), 1133-1134. doi:10.1089/jwh.2011.3050

Brown, C., Goetz, J., Van Sciver, A., Sullivan, D., & Hamera, E. (2006). A psychiatric rehabilitation approach to weight loss. *Psychiatric Rehabilitation Journal*, *29*(4), 267-273. doi:10.2975/29.2006.267.273

Carlson, J. A. (2010). Avoiding Traps in Member Checking. *Qualitative Report*, *15*(5), 1102-1113.

Casper, R. C., Sullivan, E. L., & Tecott, L. (2008). Relevance of animal models to human eating disorders and obesity. *Psychopharmacology, 199*, 313-329. doi:10.1007/s00213-008-1102-2

Centers for Disease Control (CDC). (2012). Adult obesity facts. Retrieved from http://www.cdc.gov/obesity/data/adult.html

Cheskin, L. J. (2008). A personal-contact weight-loss maintenance intervention reduced weight regain in overweight and obese adults. *ACP Journal Club*, *149*(1). doi:http://dx.doi.org/10.7326/0003-4819-149-2-200807150-02004

Clanindin, D. J. (2007). *Handbook of narrative inquiry: Mapping a methodology.* Thousand Oaks, CA: Sage Publications.

Clanindin, D.J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in Qualitative Research.* San Francisco, CA: John Wiley & Sons, Inc.

Cleland, V., Ball, K., & Crawford, D. (2013). Is a perceived supportive physical environment important for self-reported leisure time physical activity among socioeconomically disadvantaged women with poor psychosocial characteristics? an observational study. *BMC Public Health*, *13*2, 80. doi:10.1186/1471-2458-13-280

Cogan, J. C., & Rothblum, E. D. (1992). Outcomes of weight-loss programs. *Genetic, Social, and General Psychology Monographs*, *118*(4), 385-415.

Collins, J., McCabe, M., Jupp, J., & Sutton, J. (1983). Body percept change in obese females after weight reduction therapy. *Journal of Clinical Psychology, 39*(4), 507-512. doi:http://dx.doi.org/10.1002/1097-4679(198307)39:4%3C507::AID-JCLP2270390408%3E3.0.CO;2-K:

Columbi, A., & Wood, C. (2011. Obesity in the workplace: impact on cardiovascular disease, cost, and utilization of care. *American Health & Drug Benefits*, *4*(5), 271-278. Retrieved from http://www.ahdbonline.com/

Cortese, S. S., Isnard, P. P., Frelut, M. L., Michel, G. G., Quantin, L. L., Guedeney, A. A., & ... Mouren, M. C. (2007). Association between symptoms of attention-

deficit/hyperactivity disorder and bulimic behaviors in a clinical sample of severely obese adolescents. *International Journal of Obesity*, *31*(2), 340-346. doi:10.1038/sj.ijo.0803400

Creswell, J. W. (2007). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches,* (2nd end). Thousand Oaks, CA: Sage Publications.

Crocker, J., Cornwell, B., & Major, B. (1993). The stigma of overweight: Affective consequences of attributional ambiguity. *Journal of Personality and Social Psychology*, *64*(1), 60-70. doi:10.1037/0022-3514.64.1.60

Dale, K. S., McAuley, K. A., Taylor, R. W., Williams, S. M., Farmer, V. L., Hansen, P., & .. Mann, J. I. (2009). Determining optimal approaches for weight maintenance: a randomized controlled trial. *CMAJ: Canadian Medical Association Journal*, *180*(10), E39-E46. doi:10.1503/cmaj.080974

Deci, E., (2012). Self-determination theory publications webpage, Retrieved from http://selfdeterminationtheory.org/theory.

Deci, E. L. & Ryan, R. M. (eds.) (2002). *Handbook of Self-Determination Research*. Rochester, NY: University of Rochester Press.

Deci, E. L., & Ryan, R. M., (2008). Self-Determination Theory: A Macrotheory of human motivation, development, and health. *Canadian Psychology, 49*(3), 182-185. doi:http://dx.doi.org/10.1037/a0012801

Deci, E. L., & Ryan, R. M. (2012). Self-determination theory in health care and its relations to motivational interviewing: A few comments. *The International Journal of Behavioral Nutrition and Physical Activity*, *9,* 24. doi:10.1186/1479-5868-9-24.

Deci, E. L., & Ryan, R. M. (2013). http://selfdeterminationtheory.org/.

Dedert, E. A., Becker, M. E., Fuemmeler, B. F., Braxton, L. E., Calhoun, P. S., & Beckham, J. C. (2010). Childhood traumatic stress and obesity in women: The intervening effects of PTSD and MDD. *Journal of Traumatic Stress*, *23*(6), 785-793. doi:10.1002/jts.20584

Dewar, D. L., Lubans, D. R., Plotnikoff, R. C., & Morgan, P. J. (2012). Development and evaluation of social cognitive measures related to adolescent dietary behaviors. *The International Journal of Behavioral Nutrition And Physical Activity*, *9,* 1-10. doi:10.1186/1479-5868-9-36

Echols, J. (2010). Obesity weight management and bariatric surgery case management programs: a review of literature. *Professional Case Management*, *15*(1), 17-26. doi:10.1097/NCM.0b013e3181b5ebeb

Eknoyan, G. (2008). Adolphe Quetelet (1796-1874): The average man and indices of obesity. *Nephrology, Dialysis, Transplantation, 23*(1), 47-51. doi:10.1093/ndt/gfm517

Elfhag, K. K., & Rössner, S. S. (2005). Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obesity Reviews, 6*, 67-85. doi:http://dx.doi.org/10.1111/j.1467-789X.2005.00170.x

Faure, A., Reynolds, S., Richard, J., & Berridge, K. (2008). Mesolimbic dopamine in desire and dread: enabling motivation to be generated by localized glutamate disruptions in nucleus accumbens. *The Journal of Neuroscience, 28*(28), 7184-7192. doi:http://dx.doi.org/10.1523/JNEUROSCI.4961-07.2008

Festinger, L. (1957). *A Theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Finkelstein, E. A., Strombotne, K. L., & Popkin, B. M. (2010). The costs of obesity and implications for policymakers. *Choices: The Magazine of Food, Farm & Resource Issues*, *25*(3), 3-9.

Flegal, K., Carroll, M., Ogden, C., & Curtin, L. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *JAMA 303*(3), 235-241. doi:http://dx.doi.org/10.1001/jama.2009.2014

Food & Drug Administration (FDA), (2000). Phenylpropanol. http://www.fda.gov/Drugs/DrugSafety/InformationbyDrugClass/ucm150763.htm

Food & Drug Administration (FDA), (2007). Rimonabant. http://www.fda.gov/ohrms/dockets/ac/07/briefing/2007-4306b1-fda-backgrounder.pdf

Food & Drug Administration (FDA), (2010). Meridia. http://www.fda/gov/drugs/DrugSafety/jcm228746.htm

Food & Drug Administration (FDA), (2011). Phentermine. http://www.fda.gov/Safety/MedWatch/SafetyInformation/ucm279222.htm

Gao, J., Wang, J., Zheng, P., Haardörfer, R., Kegler, M., Zhu, Y., & Fu, H. (2013). Effects of self-care, self-efficacy, social support on glycemic control in adults with type 2 diabetes. *BMC Family Practice*, *14,*66. doi:10.1186/1471-2296-14-66

Gardiner, H. N. (1904). Les Obsessions et la Psychasthénie. *Psychological Bulletin, 1*(1), 6-17. doi:10.1037/h0072056. Abstract retrieved from http://psycnet.apa.org/journals/bul/1/1/6/

Gariepy, G. G., Nitka, D. D., & Schmitz, N. (2010). The association between obesity and anxiety disorders in the population: A systematic review and meta-analysis. *International Journal of Obesity*, *34*(3), 407-419. doi:10.1038/ijo.2009.252

Glasgow, R. E., Nelson, C. C., Kearney, K. A., Reid, R., Ritzwoller, D. P., Strecher, V. J., & … Wildenhaus, K. (2007). Reach, engagement, and retention in an Internet-based weight loss program in a multi-site randomized controlled trial. *Journal of Medical Internet Research*, *9*(2), 1-10. doi:10.2196/jmir.9.2.e11

Goldbacher, E. M., & Matthews, K. A. (2007). Are psychological characteristics related to risk of the metabolic syndrome? A review of the literature. *Annals of Behavioral Medicine*, *34*(3), 240-252. doi: 10.1080/08836610701677212

Goldstein, B. I., Liu, S., Zivkovic, N., Schaffer, A., Chien, L., & Blanco, C. (2011). The burden of obesity among adults with bipolar disorder in the United States. *Bipolar Disorders*, *13*(4), 387-395. doi:10.1111/j.1399-5618.2011.00932.x

Gomes, F. A., Kauer-Sant'Anna, M., Magalhães, P. V., Jacka, F. N., Dodd, S., Gama, C. S., & … Kapczinski, F. (2010). Obesity is associated with previous suicide attempts in bipolar disorder. *Acta Neuropsychiatrica*, *22*(2), 63-67. doi:10.1111/j.1601-5215.2010.00452.x

Granburg, E. (2006). "Is that all there is?" Possible selves, self change and weight loss. *Social Psychology Quarterly, 69*(2), 109-126. Retrieved from http://spq.sagepub.com/

Graves, T., Meyers, A. W., & Clark, L. (1988). An evaluation of parental problem-solving training in the behavioral treatment of childhood obesity. *Journal of Consulting and Clinical Psychology*, *56*(2), 246. doi:http://dx.doi.org/10.1037/0022-006X.56.2.246

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18, 59-82. doi:10.1177/1525822X05279903

Guller, U., Klein, L. V., & Hagen, J. A. (2009). Safety and effectiveness of bariatric surgery: Roux-en-Y gastric bypass is superior to gastric banding in the management of morbidly obese patients. *Patient Safety In Surgery*, *3,*1-4. doi:10.1186/1754-9493-3-10

Haddock, C.K., Poston, W.S., Dill, P.L., Foreyt, J. P., & Ericsson, M. (2002). Pharmacotherapy for obesity: a quantitative analysis of four decades of published randomized clinical trials. *International Journal of Obesity, 26*, 262–273. doi:http://dx.doi.org/10.1038/sj.ijo.0801889:

Haukeland, J., Konopski, Z., Eggesbø, H., von Volkmann, H., Raschpichler, G., Bjøro, K., & … Birkeland, K. (2009). Metformin in patients with non-alcoholic fatty liver disease: A randomized, controlled trial. *Scandinavian Journal of Gastroenterology*, *44*(7), 853-860. doi:10.1080/00365520902845268

Hellawell, D. (2006). Inside–out: analysis of the insider–outsider concept as a heuristic device to develop reflexivity in students doing qualitative research. *Teaching In Higher Education*, *11*(4), 483-494. doi:10.1080/13562510600874292

Heshka, S., Anderson, J., Atkinson, R., Greenway, F., Hill, J., Phinney, S., … & Pi-Sunyer, F. X. (2003). Weight loss with self-help compared with a structured commercial program. *JAMA, 289*(14), 1792-1798. doi:10.1001/jama.289.14.1792.

Heuer, C. A., McClure, K. J., & Puhl, R. M. (2011). Obesity stigma in online news: a visual content analysis. *Journal of Health Communication, 0*, 1-12. doi:10.1080/10810730.2011.561915.

Higa, K., Boone, K., & Ho, T. Complications of the laparoscopic roux-en-y gastric bypass: 1,040 Patients –what have we learned? *Obesity Surgery, 10*, 509-513 doi:http://dx.doi.org/10.1381/096089200321593706

Hoy, S. (2013). Lorcaserin: A review of its use in chronic weight management. *Drugs, 73*(5), 463-473. doi:10.1007/s40265-013-0035-1.

Isnard, P., Michel, G., Frelut, M., Vila, G., Falissard, B., Naja, W., & ... Mouren-Simeoni, M. (2003). Binge eating and psychopathology in severely obese adolescents. *International Journal of Eating Disorders*, *34*(2), 235-243. doi:10.1002/eat.10178

Jeffery, R. W., Wing, R. R., & French, S. A. (1992). Weight cycling and cardiovascular risk factors in obese men and women. *American Journal of Clinical Nutrition, 55*, 641-4. Retrieved from http://ajcn.nutrition.org/

Jemal, A., Clegg L. X., Ward E., Ries L.A., Wu, X., Jamison, P.M., … Edwards, B.K. (2004). Annual report to the nation on the status of cancer, 1975–2001, with a special feature regarding survival. *Cancer, 101*(1), 2-27. http://www.ncbi.nlm.hig.gov/pubmed/15221985.

Katan, M.B. (2009). Weight-loss diets for the prevention and treatment of obesity. *The New England Journal of Medicine, 360*(9), 923-925. doi:0.1056/NEJMe0810291

Keatley, D., Clarke, D., & Hagger, M. (2012). Investigating the predictive validity of implicit and explicit measures of motivation on condom use, physical activity and healthy eating. *Psychology and Health, 27*(5), 550-569. doi:http://dx.doi.org/10.1080/08870446.2011.605451

Kirkley, B. G., Kolotkin, R. L., Hernandez, J. T., & Gallagher, P. N. (1992). A Comparison of binge-purgers, obese binge eaters, and obese nonbinge eaters on the MMPI. *International Journal of Eating Disorders*, *12*(2), 221-228. doi http://dx.doi.org/10.1002/1098-108X(199209)12:2%3C221::AID-EAT2260120212%3E3.0.CO;2-W:

Kitsantas, A. (2000). The role of self-regulation strategies and self-efficacy perceptions in successful weight loss maintenance. *Psychology & Health*, *15*(6), 811-820. doi:10.1080/08870440008405583

Kralik, D., Van Loon, A., & Visentin, K. (2006). Resilience in the chronic illness experience. *Educational Action Research 14*(2), 187-201. doi:http://dx.doi.org/10.1080/09650790600718035

Kruger, J., Blanck, H., M., & Gillespie, C. (2006). Dietary and physical activity behaviors among adults successful at weight loss maintenance. *International*

Journal of Behavioral Nutrition and Physical Activity, 3(17). doi:10.1186/1479-5868-3-17

Kurrasch, D. M., Cheung, C. C., Lee, F. Y., Phu, V., Tran, P. V., Hata, K., & Ingraham (2007). The neonatal ventromedial hypothalamus transcriptome reveals novel markers with spatially distinct patterning. *Journal of Neuroscience, 27*(50), 13624-13634. Retrieved from http://www.jneurosci.org/content/27/50/13624.full.pdf

Latner, J. D., Stunkard, A. J., Wilson, G. T., Jackson, M. L., Zelitch, D. S., & Labouvie, E. E. (2000). Effective long-term treatment of obesity: a continuing care model. *International Journal of Obesity & Related Metabolic Disorders*, *24*(7), 893. doi:http://dx.doi.org/10.1038/sj.ijo.0801249

Levin, B. (2000). The obesity epidemic: metabolic imprinting on genetically susceptible neural circuits. *Obesity Research, 8*(4), 342-347. doi:http://dx.doi.org/10.1038/oby.2000.41

Li, M. & Cheung, B. (2009). Pharmacotherapy for obesity. *British Journal of Clinical Pharmacology*, *68*(6), 804-810. doi:http://dx.doi.org/10.1111/j.1365-2125.2009.03453.x

Lincoln, Y. S. & Guba, E.G. (1985). *Naturalistic Inquiry.* Newbury Park, CA: Sage Publications.

Livesley, W. (2012). Integrated Treatment: A conceptual framework for an evidence-based approach to the treatment of personality disorder. *Journal of Personality Disorders*, *26*(1), 17-42. doi:10.1521/pedi.2012.26.1.17

Maffeis, C., & Tatò, L. (2001). Long-term effects of childhood obesity on morbidity and mortality. *Hormone Research*, *55,* 42-45. doi:10.1159/000063462

Mason, Mark (2010). Sample size and saturation in PhD studies using qualitative interviews. Forum qualitative Sozialforschung / Forum: *Qualitative Social Research, 11*(3), Art. 8. Retrieved from http://nbn-resolving.de/urn:nbn:de:0114-fqs100387.

Mavis, B. E., & Stöffelmayr, B. E. (1994). Multidimensional evaluation of monetary incentive strategies for weight control. *The Psychological Record*, *44*(2), 239-252. Retrieved from http://thepsychologicalrecord.siu.edu/

Mendelson, S. (2008). *Metabolic Syndrome and Psychiatric Illness: Interactions, pathophysiology, assessment and treatment.* London, UK: Academic Press.

Meyers, A. W., Graves, T. J., Whelan, J. P., & Barclay, D. R. (1996). An evaluation of a television-delivered behavioral weight loss program: Are the ratings acceptable? *Journal of Consulting And Clinical Psychology*, *64*(1), 172-178. doi:10.1037/0022-00

Morrow, S.L. (2005). Quality and trustworthiness in qualitative research in counseling psychology. *Journal of Counseling Psychology, 52*(2), 250-260. doi:http://dx.doi.org/10.1037/0022-0167.52.2.250

Morgan, P. J., Lubans, D. R., Collins, C.E., Warren, J.M., & Callister, R. (2005). The SHED-IT randomized controlled trial: evaluation of an internet-based weight loss program for men. *OBESITY Journal, 17*(11), 2025-2032. doi:10.1038/OBY.2009.85

Murphy, J. M., Horton, N. J., Burke, J. R., Monson, R. R., Laird, N. M., Lesage, A. A., & Sobol, A. M. (2009). Obesity and weight gain in relation to depression: Findings from the Stirling County Study. *International Journal of Obesity*, *33*(3), 335-341. doi:10.1038/ijo.2008.273

Must, A., & Strauss, R. (1999). Risks and consequences of childhood and adolescent obesity. *International Journal of Obesity and Related Metabolic Disorders: Journal of The International Association For The Study of Obesity*, *23 Suppl 2*S2-S11v. doi:http://dx.doi.org/10.1038/sj.ijo.0800852

Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: examining the craft. *Information and organization*, *17*(1), 2-26. doi:http://dx.doi.org/10.1016/j.infoandorg.2006.11.001

Nair, R., & Ren, J. (2009). Pharmacotherapy of obesity - benefit, bias and hyperbole. *Current Medicinal Chemistry*, *16*(15), 1888-1897. doi:http://dx.doi.org/10.2174/092986709788186110

Nebeling, L., Rogers, C.J., Berrigan, D., Hursting, S., & Ballard-Barbash, R. (2004) Weight cycling and immunocompetence. *Journal of the American Dietetic Association, 104*(6): 892-4. doi:http://dx.doi.org/10.1016/j.jada.2004.03.001

Nishizaw, Y. & Bray, G. A. (1978). Ventromedial hypothalamic lesions and the mobilization of fatty acids. *The Journal of Clinical Investigation, 61*, 714-721. doi:http://dx.doi.org/10.1172/JCI108984

Ochner, C. N., Gibson, C. C., Shanik, M. M., Goel, V. V., & Geliebter, A. A. (2011). Changes in neurohormonal gut peptides following bariatric surgery. *International Journal of Obesity*, *35*(2), 153-166. doi:10.1038/ijo.2010.132

O'Connell, K., Popkess-Vawter, S., Schmoll, S., & Wendel, S. (1998). Overeating, reversal theory, and weight cycling. *Western Journal of Nursing Research, 20*(1), 67-81. Retrieved from http://wjn.sagepub.com/

Olson, M., Kelsey, S., Bittner, V., Reis, S., Relchek, N., Handberg, E., & Merz, N.B. (2000). Weight cycling and high-density lipoprotein cholesterol in women: evidence of an adverse effect: a report from the NHLBI-sponsored WISE study. *Journal of the American College of Cardiology, 36*(5), 1565-1571. Retrieved from http://content.onlinejacc.org/journal.aspx

Parker-Pope, T. (2011). The fat trap. *The New York Times*. Retrieved from NYTimes.com.

Patton, M. Q. (2003). *Qualitative Research and Evaluation Methods.* Thousand Oaks: CA: Sage Publications, Inc.

Pezze, M. A., Bast, T., & Feldon, J. (2003). Significance of dopamine transmission in the rat medial prefrontal cortex for conditioned fear. *Cerebral Cortex, 13*, 371-380. doi:http://dx.doi.org/10.1093/cercor/13.4.371

Phan, T. T., Maresca, M. M., Hossain, J., & Datto, G. A. (2012). Does Body Mass Index Accurately Reflect Body Fat? A Comparison of Anthropometric Measures in the Longitudinal Assessment of Fat Mass. *Clinical Pediatrics*, *51*(7), 671-677. doi:10.1177/0009922812440838

Pogotto, U., Vanuzzo, D, Vicennati, V., & Pasquali, R. (2008). Pharmacological therapy of obesity. *Giornale di Italiano Cardiologia (Rome).9*(4), 83S-93S. Retrieved from http://www.giornaledicardiologia.it/

Powell, L. H., Calvin, J., & Calvin, J. R. (2007). Effective obesity treatments. *American Psychologist*, *62*(3), 234-246. doi:10.1037/0003-066X.62.3.234

Pratt, K. J., Lamson, A. L., Collier, D. N., Crawford, Y. S., Harris, N., Gross, K., & … Saporito, M. (2009). Camp Golden Treasures: A Multidisciplinary Weight-Loss and a Healthy Lifestyle Camp for Adolescent Girls. *Families, Systems & Health:*

The Journal of Collaborative Family Healthcare, *27*(1), 116-124. doi:10.1037/a0014912

Puhl, R. M., Andreyeva, T. T., & Brownell, K. D. (2008). Perceptions of weight discrimination: Prevalence and comparison to race and gender discrimination in America. *International Journal of Obesity*, *32*(6), 992-1000. doi:10.1038/ijo.2008.22

Puhl, R. M. & Heuer, C. A. (2011). Public opinion about laws to prohibit weight discrimination in the United States. *Obesity, 19*(1), 74-82. doi:10.1038.oby.2010.126

Ramacciottie, C. E., Paoli, R. A., Marcacci, S, Piccinni, A., Burgalassi, A., Dell'Osso, L. & Garfinkel, P.E. (2005). Relationship between bipolar illness and binge eating disorders. *Psychiatry Res., 135*(2), 165-70. Abstract retrieved from www.ncbi.nlm.nih.gov/pubmed

Ramos, E., Meguid, M., Campos, A., & Coelho, J. (2005). Neuropeptide Y, alpha-Melanocyte-stimulating hormone, and monoamines in food intake regulation. *Nutrition* [serial online]. 21(2), 269-279.

Ravussin, E., Smith, S., Mitchell, J., Shringarpure, R., Shan, K., Maier, H., & ... Weyer, C. (2009). Enhanced weight loss with pramlintide/metreleptin: an integrated neurohormonal approach to obesity pharmacotherapy. *Obesity*, *17*(9), 1736-1743.

Reicks, M., Mills, J., & Henry, H. (2004). Qualitative Study of Spirituality in a Weight Loss Program: Contribution to Self-Efficacy and Locus of Control. *Journal of Nutrition Education And Behavior*, *36*(1), 13-19. doi:10.1016/S1499-4046(06)60123-1

Reissman, C. K. (2008). Narrative Methods for the Human Sciences. Thousand Oaks, CA: Sage Publishing.

Rogers, C. R. (1961). On becoming a person: a psychotherapist's view of psychotherapy.. Boston, MA: Houghton Mifflin.

Romanowich, P., Mintz, J., & Lamb, R. J. (2009). The relationship between self-efficacy and reductions in smoking in a contingency management procedure. *Experimental and Clinical Psychopharmacology*, *17*(3), 139-145. doi:10.1037/a0015842

Rosen, J.B., & Donley, M. P. (2006). Animal studies of amygdala function in fear and uncertainty: relevance to human research Biological *Psychology 73*, 49–60. doi:http://dx.doi.org/10.1016/j.biopsycho.2006.01.007

Rothblum, E. D. (1999). Contradictions and Confounds in Coverage of Obesity: Psychology Journals, Textbooks and the Media. *Journal of Social Issues*, *55*(2), 355-369. doi:http://dx.doi.org/10.1111/0022-4537.00120

Rothman, R. B., Blough, B. E., & Baumann, M. H. (2008). Dual dopamine/serotonin releasers: Potential treatment agents for stimulant addiction. *Experimental and Clinical Psychopharmacology*, 16(6), 458-474. doi:10.1037/a0014103

Russell, J., Storlien, L., & Beumont, P., (1987). A proposed model of bulimic behavior: effect on plasma insulin, noradrenalin, and cortisol levels. *International Journal of Eating Disorders, 6*(5), 609-614. doi:http://dx.doi.org/10.1002/1098-108X(198709)6:5%3C609::AID-EAT2260060504%3E3.0.CO;2-2

Saltzer, E. (1980). Social determinants of successful weight loss: an analysis of behavioral intentions and actual behavior. *Basic and Applied Social Psychology, 1*(4), 329-341. (Doctoral Dissertation). 10.1207/s15324834basp0104_4

Saumure, K., & Given, L. (2008). Data saturation. In Lisa M. Given (Ed.) The Sage Encyclopedia of Qualitative Research Methods. (pp. 196-197). Thousand Oaks, CA: SAGE Publications, Inc. doi:http://dx.doi.org.ezp.waldenulibrary.org/10.4135/9781412963909.n99

Sarvestani, R., Jamalfard, M., Kargar, M., Kaveh, M., & Tabatabaee, H. (2009). Effect of dietary behaviour modification on anthropometric indices and eating behaviour in obese adolescent girls. *Journal of Advanced Nursing*, *65*(8), 1670-1675. doi:10.1111/j.1365-2648.2009.05029.x

Shah, N. R., & Braverman, E. R. (2012). Measuring Adiposity in Patients: The Utility of Body Mass Index (BMI), Percent Body Fat, and Leptin. *Plos ONE*, *7*(4), 1-8. doi:10.1371/journal.pone.0033308

Shenton, A. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22,* 63–75. Retrieved from http://www.iospress.nl/journal/education-for-information/

Sit, C., & Lindner, K. (2006). Situational state balances and participation motivation in youth sport: a reversal theory perspective. *The British Journal of Educational Psychology*, *76,* 369-384. doi:http://dx.doi.org/10.1348/000709905X37190

Skloot, R. (2007). *Why is it so damn hard to change?* The Oprah Magazine. http://rebeccaskloot.com/why-is-it-so-damn-hard-to-change/

Snow, V., Barry, P., Fitterman, N., Qaseem, A., Weiss, K., (2005). Pharmacologic and Surgical Management of Obesity in Primary Care: A Clinical Practice Guideline from the American College of Physicians*. Annals of Internal Medicine. 142*(7), 525-531. doi:http://dx.doi.org/10.7326/0003-4819-142-7-200504050-00011

Stevens, J., Truesdale, K.P., Mclain, J. E., & Cay, J. (2006). The definition of weight maintenance. *International Journal of Obesity, 30*, 391-399. doi:http://dx.doi.org/10.1038/sj.ijo.0803175

Strychar, I., Lavoi, M.E., Messier, L., Karelis, A. D., Doucet, E., Prud'homme, D., … & Rabasa-Lhoret, R. (2009). Anthropometric, metabolic, psychosocial, and dietary characteristics of overweight/obese postmenopausal women with a history of weight cycling: a MONET (Montreal Ottawa New Emerging Team) study.

Journal of the American Dietetic Association, 109(4): 718-24. doi:http://dx.doi.org/10.1016/j.jada.2008.12.026

Svec, F., Muehlenhein, M., & Porter, J. (2003). The effects of phenylpropanolamine on Zucker rats selected for fat food preference. *Nutritional Neuroscience*, *6*(2), 93-102. doi:http://dx.doi.org/10.1080/1028415031000094291

Taber, C. W., & Thomas, C. L. (2009). *Taber cyclopedic medical dictionary*. Philadelphia, PA: F.A.Davis

Tavares, L. S., Plotnikoff, R. C., & Louaides, C. (2009). Social-cognitive theories for predicting physical activity behaviour of employed women with and without young children. *Psychology, Health & Medicine*, *14*(2), 129-142. doi:10.1080/13548500802270356

Thaler, J., Yi, C., Schur, E. A., Guyenet, S. J., Hwang, B. H., Dietrich, M. O., …Schwartz, M. (2011). Obesity is associated with hypothalamic injury in rodents and humans. *The Journal of Clinical Investigation*, *122*(1), 153–162. doi:10.1172/JCI59660*s*

Tor, P., & Lee, E. (2008). Treatment emergent mania responding to valproate in a Chinese female adolescent population with eating disorders: A case series. *European Eating Disorders Review*, *16*(6), 421-426. doi:10.1002/erv.877

Tsai, A., & Wadden, T. (2005). Systematic review: an evaluation of major commercial weight loss programs in the United States. *Annals of Internal Medicine*, *142*(1), 56. doi:http://dx.doi.org/10.7326/0003-4819-142-1-200501040-00012

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic role of intrinsic goals and autonomy-support. *Journal of Personality and Social Psychology, 87*, 246–260. Retrieved from http://psycnet.apa.org/journals/psp/

Veerman, J., Barendregt, J., Forster, M., & Vos, T. (2011). Cost-effectiveness of pharmacotherapy to reduce obesity. *PLos ONE6*(10), e26051. doi:101371/journal.pone.0026051

Vergoni, A.V., & Bertolini, A. (2000). Role of melanocortins in the central control of feeding. *European Journal of Pharmacology. 405*(1-3), 25-32. http://www.ncbi.nlm.nih.gov/pubmed/11033311

Vetrivel, U., Ravichandran, S., Kuppan, K., Mohanlal, J., Narashima Das, U. & Narayanasamy, U. (2012). Agonistic effect of polyunsaturated fatty acids (PUFAs) and its metabolites on brain-derived neurotropic factor (BDNF) through molecular docking simulation. *Lipids in Health and Disease, 11*, 109. http://www.lipidworld.com/content/11/1/109.

Vieweg, W. R., Julius, D. A., Fernandez, A., Levy, J. R., Satterwhite, L., Benesek, J., … Pandering, A. K. (2006). Posttraumatic stress disorder and body mass index in

military veterans: The Richmond experience. *Stress, Trauma and Crisis: An International Journal*, *9*(1), 17-28. doi:10.1080/15434610500506217

Wang, C.F., Bomberg, E., Levine, A., Billington, C., & Kotz, C. (2007). Brain-derived neurotrophic factor in the ventromedial nucleus of the hypothalamus reduces energy intake. *American Journal of Physiology Regulatory, Integrative and Comparative Physiology*, 293, R1037-R1045. doi:10.1152ajpregu.00125.2007

Williams, G., Grow, V., Freedman, Z., Ryan, R., & Deci, E. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology, 70*(1), 115-126. doi:10.1037/0022-3514.70.1.115

Womble, L., Williamson, D., Martin, C., Zucker, N., Thaw, J., Netemeyer, R., & … Greenway, F. (2001). Psychosocial variables associated with binge eating in obese males and females. *The International Journal of Eating Disorders*, *30*(2), 217-221. doi:http://dx.doi.org/10.1002/eat.1076

Woo, J., Sea, M.M., Tong, P. Ko, G.T., Lee, Z., Chan, J., & Chow, F. C. (2007) Effectiveness of a lifestyle modification programme in weight maintenance in obese subjects after cessation of treatment with Orlistat. *Journal of Evaluation in Clinical Practice 13*(6), 853-859. doi:http://dx.doi.org/10.1111/j.1365-2753.2006.00758.x

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. *Applications of social research methods to questions in information and library science*, 308-319. Retrieved from https://www.ischool.utexas.edu/~yanz/Content_analysis.pdf

Zieve, D. (2012). Biliopancreatic diversion with duodenal switch. http://www.nlm.nih.gov/medlineplus/ency/imagepages/19500.htm

Appendix A: Web Based Invitation

You are invited to take part in a research study of people who have lost and regained at least 20% of their highest weight more than once and kept the weight off for at least 2 years. (For example, your highest weight was 250 lbs, you lost 50 lbs more than once and you have been 200 lbs or less for the last two years.) The researcher is inviting women and men over the age of 18 who have achieved the goal of healthy weight maintenance who are not currently struggling with an active eating disorder, illness, or other condition that would result in weight loss due to the condition. This study is part of the requirement for a doctoral degree at Walden University.

The interview is expected to be 60 to 90 minutes. If you are over 18, in good health (i.e., currently free of active addictions, active eating disorders, or serious illness known to impact appetite and you are not pregnant) have maintained a healthy weight loss for at least two years, and would like to participate, please contact Cheri Lewis via this page, by phone (425) 638-9966, cheri.lewis@waldenu.edu, or her website http://www.cherilewis.com.

Invitation to Colleagues

Thank you for assisting me in sharing information about my study with individuals with a history of repeated weight loss through dieting and/or exercise. This is part of the degree requirement for the doctoral program at Walden University. I would like to interview individuals who have lost and regained 20% of their body weight at least two times and

have maintained a healthier weight for at least two years for reasons other than physical illness. If you know someone who is over 18, in good health (i.e., currently free of active addictions, active eating disorders, or serious illness known to impact appetite) and has maintained a healthy weight loss, and would like to participate, please have them contact Cheri Lewis via her Facebook page, or her website http://www.cherilewis.com.

Appendix B: Participant Screening Guide

Thank you for your interest in my study. I have a few questions to ask you to determine if your experience with weight loss meets the criteria for the study. You are free to decline to answer any of the questions if you are not comfortable doing so. Do you have about 10 minutes?

Contact Information:

What is your name?

What is your phone number?

What is your email?

1. *How long have you been able to maintain your current weight?*
2. *How many times would you estimate you have lost and regained 20% of your body weight?*
3. *Is there any possibility you are pregnant? Do you have a history of physical or mental illness or condition that significantly impacts appetite—either increasing or decreasing it? (If yes: What is the condition? How does it impact your appetite?)*

Thank you so much for interest in our study.

For persons who meet the criteria: Let's set up a time, date and location for the interview. I will email you a Consent Form to return with your signature before or at the interview.

For people who do not meet the criteria: Thank you again for your interest. I'm not able to interview you at this time, as the study has certain participant requirements.

For people that I am uncertain about their appropriateness for the study: Thank you again for your interest. I'm not able to interview you at this time, as the study has certain participant requirements. However, there may be an opportunity to interview at a later date. May I verify your contact information and call you at a later time?

Appendix C: Consent Form

You are invited to take part in a research study of people who have lost and regained at least 20% of their highest weight more than once and kept the weight off for at least 2 years. (For example, your highest weight was 250 lbs. you lost 50 lbs. more than once and you have been 200 lbs. or less for the last two years.) The researcher is inviting women and men over the age of 18 who have achieved the goal of healthy weight maintenance who are not currently struggling with an active eating disorder, illness, or other condition that would result in weight loss due to the condition. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Cheri Lewis, who is a doctoral student that Walden University This study is part of the degree requirement for the doctoral program.

Background Information:

The purpose of this study is to understand the experiences of individuals who have shifted from repeated weight loss and gain to healthy weight maintenance.

Procedures:

If you agree to be in this study, you will be asked to:

- Participate in a 60 minute interview

  - Interviews will be conducted face to face when possible. Otherwise, they will be conducted by Skype or phone.
  - The interviews will be audio recorded.
- Review a summary of the interview that was prepared by the researcher if you would like (it is not required).
- Revise, correct or add to the summary to increase accuracy and insure that you feel comfortable with what you have disclosed if you would like to. This can be returned by email, regular mail, fax or discussed over the phone.

Here are some sample questions:

- "What was it like before the last round of weight loss?"
- "What was the turning point in your decision to lose weight?"
- "What happened after that?"
- "Where are you now?"

Voluntary Nature of the Study:

This study is voluntary. Information shared in the screening process and the interview will be included in the study. Everyone will respect your decision of whether or not you choose to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this type of study might bring up minor discomforts similar to those experienced in daily life, such as feeling sad or anxious while telling your story. The potential benefit of the study is for individuals with similar stories struggling with weight cycling (repeated weight loss and regain), and for professionals who want to help those individuals.

Payment:

No payment is offered for participating in this study.

Privacy:

Any information you provide will be kept confidential. I will not use your personal information for any purposes outside of this research project. Also, I will not include your name or anything else that could identify you in the study results. Data will be kept secure by the researcher, Cheri Lewis, in a locked file cabinet maintained in a locked offsite storage facility for at least 5 years, as required by the University.

Contacts and Questions:

You may ask any questions you have now. If you have questions later, you may contact me by phone (425.638.9966), or email (cheri@cherilewis.com). If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1210. Walden University's approval number for this study is 09-18-14-0041377 and it expires on September 17, 2015.

In the event that participation in the study brings about uncomfortable feelings, the following organizations can provide referrals as appropriate: Seattle Community Network Counseling (www.scn.org/crisis/counseling.); 211, the Seattle area resource line, and 1-866 - 4CRISIS.

I will give you a copy of this form to keep.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix D: Interview Guide

When did your journey start? What was that like for you?

How many times have you lost and regained large amounts of weight? Tell me more about that. What was the turning point for you? What did that mean for you?

(SCT) What role did weight play in how you saw yourself? – Your identity? What did that look like? What did that mean for you?

At the point where it changed for you, how did you feel about your ability to stop the cycle of regain? What did that look like? What did that mean for you?

(SDT) What motivated you to start losing weight? How did this compare with what motivated you to stay with it?

(SCT/SDT) What role did your personal relationships play in the gain/loss cycle and then in the maintenance cycle? What did that look like?

Where are you now? What is your day like?

(SCT) How would you describe yourself today? (SDT/SCT) What role does weight management play in your life? Is this different from before? How?

SCT-Social cognitive theory

SDT-Self-determination theory

Appendix E: Table 1

Research Sub-Questions (SQ) and Corresponding Interview Guide Question

Sub-Questions (SQ)	Interview Questions	Examples of Probing Questions
How does the narrative start?	Tell me about the start of your weight loss journey—when did you first become conscious that weight was an issue?	• *What do you remember about that moment? Was there an event or an interaction you can describe?* • *What meaning did that have for you?*
What are the turning points in the journey	What is the next meaningful event or experience in the weight loss journey? (this is repeated throughout the interview)	• *What do you remember about that moment? Was there an event or an interaction you can describe?* • *What meaning did that have for you?* • *What makes this event a "turning point" in journey to lose weight?*
What is the meaning of repeated efforts?	Has [what you just described about losing then regaining weight/cycling] happened before?	• *What is that experience [repeated efforts of losing and gaining weight] like?* • *What does "cycling" mean to you?*
How is the "self" or "identity" described	* Tell me more about how you described yourself [at the time… and at the different turning points]?	• *What does it mean to identify yourself as….?*
What are the meaningful sources of support?	* Tell me more about who/what was a source of support [at the time… and at the different turning points]?	• *What does support mean to you?*

Appendix F: Table 2

A Priori and Emergent Codes (n = 6)

A Priori Codes	Emergent Codes
Weight Loss	Achilles's Heel
Quality of Life	Adjustments to Routine
The Role of Relationships	Food (Apples, Corn, Sugar)
Turning Points	Alcohol
	Binge Type Eating
	Compulsion
	Fat Food
	Food Anxiety
	Food
	Hiding
	"I'm a Fat Person"
	Plans
	Identity
	Intimacy/Sex
	Obsession
	Program.
	Protective Patterns of Behavior

A Priori Codes	Emergent Codes
	Restrictive Eating
	Self-Aware
	Strengths
	Therapy
	Thought Patterns
	Tools

Appendix G: Table 3

Pharmaceuticals for Weight Loss

Drug	Category	Mechanism	Common Side Effects	Approved for Weight Loss?
Belviq	Appetite suppressant	Activates serotonin receptors	Dizziness, headache, dry mouth (hypoglycemia for type 2 diabetics	Yes
Orlistat	Fat absorption blocker	Binds with fat receptors	Oily stool, fecal incontinence	Yes
Phenylpropanol	Appetite suppressant	Releases norepinephrine	**Stroke**	Recalled 2005/FDA website
Phentermine	Appetite suppressant	Releases norepinephrine, dopamine		Yes

Drug	Category	Mechanism	Common Side Effects	Approved for Weight Loss?
Diethylproprion	Appetite suppressant	Releases norepinephrine		Yes
Dexfenfleuramine	Appetite suppressant	Releases serotonin		Recalled 1997
Fenfleuramine	Appetite suppressant	Releases serotonin		Recalled 1997
Sibutramine	Appetite suppressant	Suppresses reuptake of serotonin and norepinephrine		Recalled 2010
Rimonabant	Appetite suppressant	Binds with cannibinoid receptors		Recalled 2009

Curriculum Vitae

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Bellevue, WA 98005 email: clewis_tas@msn.com

Mail: 4580 Klahanie Dr. SE, #126

Issaquah, WA 98029

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Professional Experience

6/07 – Present. Private Practice, Sole Practitioner treating individuals, couples, families, groups. Consultations to business and private sector. Emphasis on Stress and Health, Obesity, Chronic Illness.

Bellevue, WA

1/06 – 6/07 Mental Health Counselor, Mercy Medical Center. Assess and treat acutely mentally ill adults and children presenting at the BHU in crisis. Facilitate referrals for community resources; develop strategies to prevent/reduce symptoms. Interventions include individual, family, and group therapy. Delegate work as appropriate, streamline protocols to adapt to reduction in staff initiated January 2006. De-escalate patients on the milieu as needed; participate in codes as necessary for patient safety. Work as part of interdisciplinary team, facilitate team meeting daily.

Roseburg, OR

1/05 – 1/06: Mental Health Counselor, Counseling and Psychological Services (CAPS) Counsel individuals with diverse mental health issues including but not limited to bipolar disorder, borderline personality disorder, adjustment disorders, Asperger's syndrome, major depression, post traumatic stress disorder, substance abuse, and disordered eating. Limited resources require utilization of community and campus resources, willingness to fill in where needed (front desk, supervisory duties, etc.)

Cheney, WA

7/04-9/05 Mental Health Counselor, Sole Practitioner, The Awakening Spirit Counseling. Developed private practice, maintaining case load of 8-12 clients with various mental health issues, often presenting with co-occurring diagnoses. Developed referral sources

from local mental health agency, women's center, colleagues and advertising. Developed open bi-weekly cognitive behavioral therapy focused depression group for disadvantaged population served by the Women's Hearth (pro bono).

Spokane, WA

9/00 – 6/02 Peer Instructor, Eastern Washington University. Taught behavioral based class over four quarters, "High Risk Behavior, Dealing with friends, sex and drugs." Received high evaluations, assisted Dr. Cleanthous with development of new instructor training protocol.

Cheney, WA

9/01 – 4/02 Sexual Assault Victim's Advocate (non-paid). Lutheran Social Services. Sexual Assault Victim's Advocate for victims and family members. Attend monthly meetings, work on-call 12 and 24-hour shifts for both hospital calls and crisis line. Refer clients to appropriate service organizations; communicate rights of victims and responsibilities to report for minors.

Spokane, WA

Education

2006-Present: Health Psychology, Doctorate Program; Walden University

2002-2004 Masters of Science in Applied Psychology Eastern Washington University

1999-2002 Bachelor of Science in Developmental Psychology Eastern Washington University

Research Experience

01/11-present Research barriers to healthy weight maintenance among obese chronic weight cyclers

9/03-6/04 Research Project, Master's Program; a correlational study of life satisfaction and ethnic identity among multiracial and biracial young adults. Project included IRB review, thorough literature review, data collection and analysis, write up, and oral presentation.

1/00 – 6/02 Data input and analysis: Experience gathering, entering and analyzing data for High Risk Behavior Research Project using SPSS.

Trainings/Workshops Performed

11/06 Communicating effectively with patients in crisis, Mercy Medical Center

7/04 Parenting skills workshop, Spokane Community College Learning Annex

5/04 Teaching seminar, "Working with the GLBTQ Community," EWU Counseling Center

5/04 Alcohol screening and education, EWU

4/04 Trauma response and screening training for student Greek system, EWU

3/04 Co-facilitate mental health awareness seminar for student residence housing, EWU

3/00 Guest presenter in adult development class, activity based training re physical limitations associated with aging and illness related disability, EWU