The Qualitative Report Volume 16 Number 3 May 2011 860-880
http://www.nova.edu/ssss/QR/QR16-3/zunker.pdf

Applying Grounded Theory to Weight Management among Women: Making a Commitment to Healthy Eating

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In this study we developed a theory grounded in data from women who continued healthy eating behaviors after a weight management program. Participant recruitment was guided by theoretical sampling strategies for focus groups and individual interviews. Inclusion criteria were: African American or Caucasian women aged 30+ who lost ≥ 5% of their body weight in a weight management program ≥ year ago. Participants ≥ 5% below their baseline weight were maintainers (n = 9); those above were non-maintainers (n = 14). We asked open-ended questions regarding healthy eating behaviors. The systematic design is described in detail, including categories from open coding, connection during axial coding, and integration into a theory, labeled Commitment to Healthy Eating, during selective coding. Procedures for establishing credibility are also included. Key Words: Grounded Theory, African American, Women, Systematic Approach, and Weight

Research suggests that a modest amount of weight loss can provide health benefits and reduce risk factors; unfortunately, many dietary and behavioral treatments have failed to demonstrate long-term weight maintenance (Ogden, Yanovski, Carroll, & Flegal, 2007). Many women are unable to maintain their body weight loss through continued healthy lifestyle behaviors following a weight management program. As evidenced in the literature, establishing and maintaining healthy eating behaviors is a difficult process (Wing, Tate, Gorin, Raynor, & Fava, 2006). Discovering ways to successfully maintain long-term weight loss relies heavily on making continued conscious efforts to choose healthy foods and engage in behaviors adopted during a weight management program (e.g., planning meals, eating when hungry).

Weight maintenance is influenced by a number of factors (e.g., biological, behavioral, environmental) that contribute to an energy balance between consumption and expenditure (Stein & Colditz, 2004). Understanding how individuals conceptualize and define healthy eating as well as how they apply multiple eating strategies that prompt healthy eating behaviors needs to be explored (Falk, Sobal, Bisogni, Connors, & Devine, 2001). Many individuals, especially women, succumb to fad diets, poor nutrition choices, and foster negative relationships with food. An international study of food choice behaviors found that women have a greater likelihood of dieting and greater belief in the importance of healthy diets compared to men (Wardle et al., 2004). A recent United States (US) survey also found that the use of dietary supplements for weight loss was more common among women compared with men and more common among African Americans than Caucasians (Pillitteri et al., 2008).

Little is known about the process of how women continue to make healthy food choices after completing a weight management program. Many intervention studies focus on the process of losing weight during a program and fail to follow participants

post-intervention. An exception is the National Weight Control Registry (NWCR) developed by Rena Wing and James Hill in 1994, which is the largest prospective study of long-term successful weight loss maintenance.

Unfortunately, studies that explore the underlying causes of overweight, obesity, and poor eating behaviors among women remain scarce with limited knowledge of unique sociocultural perceptions of various racial groups that may mitigate prevention and treatment (i.e., many African American women report the perception of larger ideal body sizes as acceptable; Roberts, Cash, Feingold, & Johnson, 2006). There appears to be a sociocultural connection between women and food with women feeling responsible for food consumption and preparation involving themselves and their families (Budd, 2007). In addition, few long term weight management studies have examined the influence of social support from family, friends, and other role models (Barnes et al., 2007).

Research studies that focus on *how* women continue to manage their weight by maintaining healthy eating behaviors after a weight loss program are lacking. Thus, the purpose of the current study was to explore the process of how African American and Caucasian women aged 30 and older maintained healthy eating behaviors one year or longer after participating in the *EatRight* Weight Management Program. *EatRight* is a university-based weight management program that emphasizes eating more lower-energy dense foods (e.g., fruits, vegetables, low-fat dairy) and fewer higher-energy dense foods; it is a lifestyle-oriented weight control program designed to beat the odds of the weight-loss battle by helping participants develop new eating habits.

This study was exploratory in nature and explains how facilitating and complicating concepts influence and contribute to maintaining healthy eating behaviors after a weight management program. The study examined the central phenomenon or "core category" of how women maintain healthy eating choices and was guided by the following central research question: "How do African American and Caucasian women maintain healthy eating behaviors after completing a weight management program?"

At the time of this study, I (the first author) was a doctoral candidate in the Department of Health Behavior in the School of Public Health at the University of Alabama at Birmingham (UAB) located in the southern part of the United States and the second author was an invaluable member of my dissertation committee with expertise in qualitative methodology. I became involved with the *EatRight* program while working as a Research Assistant at UAB and developed an interest in what influenced some patients to lose weight and keep it off while others were unsuccessful. This study was conducted as part of my dissertation research.

Methods

Qualitative Approach to Research

Methodology refers to a way of thinking and studying social phenomena (Corbin & Strauss, 2008). Qualitative research is characterized by allowing researchers to identify a wide range of understandings, meanings, and values by which individuals make sense of their everyday experiences (Strauss & Corbin, 1998). The qualitative researcher typically focuses on a relatively small, purposeful sample for collecting information-rich

insights (Patton, 2002). A qualitative approach, or methodology, allows the researcher to capture the "inner experience of participants" and discover how meanings are formulated through culture (Corbin & Strauss, p. 12).

Choosing a research problem to focus on and developing research questions are important first steps to designing a study. Beginning with a broad topic, such as obesity and weight management, then narrowing the field to dietary behaviors among a specific group of women can lead to a variety of potential research questions (Corbin & Strauss, 2008). The research question guides the methodological approach needed to conduct the research (Corbin & Strauss). The question of how women maintain healthy eating behaviors is a multifaceted process because it is deeply rooted in culture, influenced by internal and external factors, and conveys different meanings (Contento, Williams, Michela, & Franklin, 2006).

Based on the research question, I felt that qualitative methods would generate data that to help us understand the process of maintaining healthy behaviors. In addition, the data was also collected from women who did not maintain their healthy eating behaviors (i.e., non-maintainers) in order to compare groups and examine what factors contribute to different experiences (Corbin & Strauss, 2008). Many individuals regain weight after completing a weight loss program; however, little research has been conducted on who is most vulnerable to weight regain and discovering ways to prevent it (Weiss, Galuska, Khan, Gillespie, & Serdula, 2007). Therefore, the main reason for choosing a qualitative methodology was the nature of the research problem with the aim of exploring how two ethnic groups of women who participated in *EatRight* continued to maintain their healthy eating behaviors.

Grounded Theory

Creswell (2007) reports five approaches to conducting qualitative research: narrative, phenomenological, grounded theory, ethnographic, and case study. Each approach, or tradition, has specific organizing styles in regard to how data is collected and analyzed (Crabtree & Miller, 1999). We (dissertation committee and I) chose grounded theory since it provides a systematic approach for building useful theories by applying analytic tools to organize raw data (Strauss & Corbin, 1998). The grounded theory approach goes beyond description to *understand* and/or *explain* a concept; it is used to develop a theory to "help explain practice or provide a framework for further research" (Creswell, 2007, p. 63). A key characteristic is that the theory development is generated in data from participants that experienced the process (Strauss & Corbin). It identifies a core social psychological process based on context-dependent observations using constant comparative methods (Crabtree & Miller).

Sampling Methods

The target population for the current study was identified as women who struggle to manage their weight over time. Unfortunately, many women who lose weight during a program tend to regain their weight and lose the associated health benefits. The current study includes information collected from maintainers and non-maintainers of the *EatRight* program since information from both groups was needed to congregate

expertise from both perspectives in the area of weight management. In addition, both African American and Caucasian women were selected since they constitute the majority of *EatRight* participants and to allow for comparisons between ethnic groups. Comparing ethnic groups was important because of the way some women lose larger percentages of weight in comparison to others, have different reasons for losing weight and wanting to eat healthy, and because some may be at higher risk for regaining weight following a program (Weiss et al., 2007).

Purposeful sampling techniques, such as theoretical sampling, using a maximum variation strategy, guided my participant recruitment for the current study. Theoretical sampling is concept driven, allowing relevant discoveries to emerge that address the research problem (Corbin & Strauss, 2008). A theoretical sampling method allows flexibility in studying a target population (i.e., former *EatRight* participants) and allows the researcher to continue sampling from the group as needed (Creswell, 2007). Theoretical sampling begins after the initial analytic session and continues throughout the study allowing the researcher freedom to follow up on questions based on new analytic threads (Corbin & Strauss). As a general guideline, sufficient sampling includes 20 to 30 individuals to form an in-depth theory (Corbin & Strauss; Creswell, 2007).

The current study required all participants to meet four inclusion criteria: (a) self-report their ethnicity as either African American or Caucasian; (b) age 30 or older; (c) participated in *EatRight* at least one year ago or longer at the time of the current study; and (d) must have lost a minimum of 5% body weight while in the program. The next section describes how women were recruited for the study and provides individual characteristics of participants, including age, ethnicity, date they started *EatRight,* and percentage of weight lost.

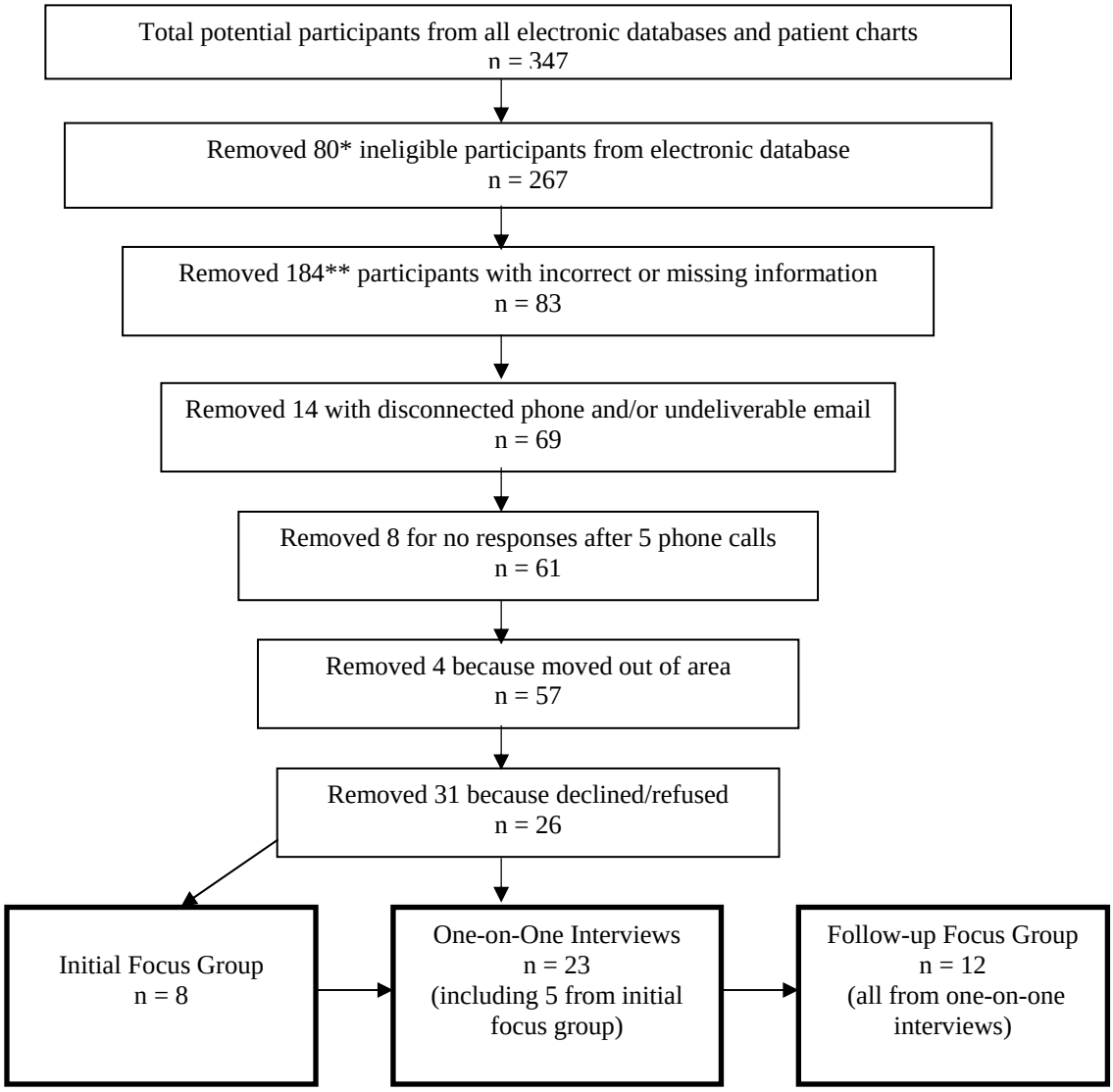
Recruitment Process

Former *EatRight* participants were primarily identified using an electronic medical records database, RemedyMD®., which tracks individuals who participated in any part of the *EatRight* Program, including Lifestyle, Risk Reduction, and OPTIFAST®. Over 300 women appeared to have met the preliminary inclusion criteria for age and ethnicity. However, 80 were ineligible for currently or recently attending an *EatRight* class or receiving clinical services within the past year. This number was further reduced due to errors in the database (e.g., incorrect weight, duplicate entries, mislabeled gender), which were discovered by comparing electronic data with patient charts (i.e., paper files). The pool of potentially eligible participants was further reduced due to outdated contact information, relocation out of the area, and failure to communicate after five attempts, including sending email, calling by phone, and leaving voicemails. A flowchart provides a detailed description of how the final study participant sample was recruited.

Before beginning the study, I obtained approval from the UAB Institutional Review Board. I invited eligible women to participate in this study by phone and/or email. Participants were invited to take part in one or more of the following phases: the initial focus group, individual interview, and follow-up focus group. The informed consent forms explained that participation was voluntary and assured anonymity and confidentiality except under certain circumstances. Informed consent was collected from participants for the initial focus group, individual interview, and follow-up focus group.

The focus groups and individual interviews were recorded with permission of the participants. Each participant chose a pseudonym for use in the study to ensure anonymity. Only the primary researcher had a list of participant names and their corresponding alias. A total of 26 women participated in a focus group and/or individual interview (see Figure 1).

Figure 1. *Recruitment Process for Participants*[1]



[1] *Ineligible entries included inquirers (requested information, never participated in program), maintainers (currently enrolled in EatRight for Life maintenance classes), patients from other clinics
**Incorrect information included wrong age, initial weight, start date, mislabeled gender, ethnicity, outdated contact information

Data Collection

This section includes a description of the three phases of data collection: initial focus group, individual interviews, and follow-up focus group. All meetings were conducted on the UAB campus in the Webb Nutrition Sciences building. This location was chosen since most *EatRight* participants were familiar with this location and necessary equipment for measuring height and weight was available.

Initial focus group. First, an initial focus group was convened to gain a preliminary understanding of the factors that influenced women to join *EatRight*, what they learned about healthy eating, and how they continued to manage their weight. Approximately six to ten participants may generally be considered a good-size for a focus group (Morgan, 1998). The researcher's past experience conducting focus groups suggested a need to over-recruit since we anticipated that some individuals would not show up (Zunker et al., 2008). The researcher called and/or emailed eligible participants who met the selection criteria (e.g., African American or Caucasian, $\geq$ age 30, lost $\geq$ 5% body weight during *EatRight* $\geq$ 1 year) and scheduled the initial focus group after 14 women agreed to participate. Eight of the fourteen women participated in the initial focus group, which lasted 90 minutes. This information was used to guide the development of the individual interview script.

The protocol and script for this focus group was guided by the format of previous focus groups conducted by the researcher. The framework for the script was based on the literature and developed through feedback from the dissertation committee with a primary goal of exploring how some women continue to maintain weight with healthy eating habits compared with women who regain weight (e.g., Barnes et al., 2007; Furst, Connors, Bisogni, Sobal, & Falk, 1996). Some of the initial focus group questions included "What interested you in the *EatRight* program? How did your eating behaviors change? What are some of your healthy eating strategies?"

Three female researchers conducted the initial focus group: the primary researcher (Caucasian, doctoral-level public health student) moderated and two female doctoral-level public health graduate researcher assistants (one was African American; one was Caucasian). The African American researcher also served as the co-interviewer for the individual interviews with the African American participants. The Caucasian researcher worked closely with *EatRight* participants, including clinic patients and personal training clientele. Other qualitative research studies have used similar methods to explore ethnicity-specific differences in body satisfaction: focus groups with ethnically diverse groups of women were moderated by a Caucasian female doctoral student and cofacilitated by an African American doctoral student (Rubin, Fitts, & Becker, 2003).

The focus group was recorded using two digital recorders. Assistants took notes and were reviewed by the moderator and the assistants. A total of eight women (n = 5 African American, n = 3 Caucasian) with a mean age of 48 $\pm$ 15.32 participated in the initial focus group in November 2008. They had a self reported mean weight of 180.13 $\pm$ 27.04 pounds and mean height of 64.81 $\pm$ 3.32 inches. In addition, all participants were weighed to the nearest 0.5 pound using an electronic scale. Measured mean weight was 184 $\pm$ 26.17 pounds and mean height was 64 $\pm$ 2.84 inches with a mean BMI of 32 $\pm$ 3.79 kg/m^2.

Individual interviews. After conducting the initial focus group and analyzing data, the semi-structured individual interview script was developed by the researcher. The interview protocol contained open-ended questions that were primarily guided by the findings from the focus group. Several members of the *EatRight* staff reviewed the script for content validity, including the *EatRight* Medical Director; two female registered dieticians; and a clinical research assistant.

The open-ended interview questions encouraged participants to discuss their experiences with healthy eating behaviors. In addition, probing and back-up questions allowed opportunities to elaborate upon their personal experiences (Corbin & Strauss, 2008). The individual interview protocol was pilot tested with two members of the target population from a similar population as the participants (i.e., age 30 and older, one African American woman and one Caucasian woman) who were currently enrolled in *EatRight*. It was anticipated that current members, who were excluded from the full study, would provide insight into the interview questions, identify any major problems or concerns, check that the questions flowed smoothly, and provide rich responses since they were currently active in the program.

Qualitative data collection uses the constant comparative method, also known as the "zigzag process": collection leads to analysis, which leads to concepts that generate questions and these questions lead to more data collection until the point of saturation when all the concepts are explained (Corbin & Strauss, 2008). This process of simultaneous data collection and analysis allows for constant comparison, which compares different pieces of data or incidents for similarities and differences and identifies dimensions specific to categories/themes (Corbin & Strauss).

Corbin and Strauss (2008) report that the researcher continues to gather data until reaching saturation and caution that arriving at the point of saturation is a complex process. They indicate that a saturated theory occurs when no more new categories emerge and well-developed relationships exist among major categories with depth and variation. Based on purposeful sampling, I continued to collect and analyze data by interviewing new participants until reaching the point of theoretical saturation. I analyzed each interview transcript line by line during the open coding process and created a list of codes. Analysis of the transcripts showed that no new categories and themes emerged after conducting 18 interviews, which suggested saturation. Five additional participants were interviewed and transcripts were coded. Many of the same ideas, or variations of similar ideas, were described by these participants. Theoretical saturation was achieved with a total of 23 individual interviews, including nine maintainers and 14 non-maintainers.

Follow-up focus group. After conducting all individual interviews, the questions for the follow-up focus group were developed based on findings from the individual interviews with participants. These questions were intended to help to ensure accurate interpretation of the findings and allow participants to provide input regarding the preliminary findings. The expected outcome of the follow-up focus group was enhanced validity/credibility by reiterating input and allowing participants to make modifications to reflect inclusiveness.

It was important to ensure that the findings adequately applied to all participants and that participants' input was correctly interpreted. At the same time, the researcher acknowledged the possibility of unique social realities and different construction of meanings (Corbin & Strauss, 2008). All 23 women who participated in individual interviews were invited to participate in the follow-up focus group.

Fifteen women agreed to attend the follow-up in April 2009. A total of 12 women (n = 8 African American, n = 4 Caucasian) with a mean age of 50 $\pm$ 9.36 years and measured mean BMI of 34 $\pm$ 4.43 kg/m^2 attended the follow-up. Six women were maintainers and six were non-maintainers. Women in the follow-up focus group were slightly older and larger than women in the initial focus group (mean age of 48 compared to 50; mean BMI of 32 kg/m^2 compared to 34 kg/m^2). The remaining 11 women were unavailable to participate at that time.

Data Analysis

An important feature of grounded theory data analysis is to begin analysis after the first data collection encounter instead of waiting until all data are collected (Strauss & Corbin, 1998). Analysis included writing field notes, reviewing transcripts, coding interviews, and discussing findings with the co-interviewer and dissertation committee.

I conducted data analysis, as guided by Corbin and Strauss (2008), with an optimal schedule of analyzing each interview prior to the next interview, but remained flexible when this was not possible. For example, transcription and analysis could not be done using the optimal schedule when two participants were interviewed on the same day.

Corbin and Strauss (2008) report a number of analytic tools, including asking questions and drawing comparisons, considering various meanings of a word (exploring different meanings by looking for data cues to aid in accurate interpretation), drawing upon personal experience (use our own experiences to elicit other information), and looking for a negative case (one that does not fit the pattern). I consulted members of *EatRight* staff and the co-interviewer for input on exploring alternative meanings to words or phrases used by participants. For example, one African American participant referred to most women in her family as being "healthy," which actually meant that most of them were overweight.

Asking questions. The first fundamental analytic tool of asking the participants questions allowed the research team to probe, develop preliminary answers, and get acquainted with the data (Corbin & Strauss, 2008). Questions often began as open ended and became more refined with the evolving analysis; types of questions included sensitizing, theoretical, practical, and guiding (Corbin & Strauss).

Making comparisons. The second fundamental analytic tool is comparative analysis, including constant comparisons and theoretical comparisons (Corbin & Strauss, 2008). Constant comparison allowed me to compare incident with incident in order to classify and group data according to its similarities and differences. Each incident potentially exposed different dimensions of the same idea and were used to develop categories during the open coding process. The purpose of theoretical comparisons was

to assist with discovering an understanding of the phenomenon by taking a personal experience or experience from the literature to clarify meaning at a more abstract level. This technique assisted us in understanding the mood or tone a participant was trying to convey.

Transcription and Analysis Software

Based on other qualitative studies and my previous experience with conducting interviews, it was expected that each interview would take approximately 45 to 60 minutes. It was further anticipated that each individual interview would take approximately six hours to transcribe since transcription often takes four to six hours for each hour of interview (Crabtree & Miller, 1999). I transcribed each interview within two weeks from the date it was conducted.

All individual interviews were audio-recorded using two digital recorders, including a Sony ICD-SX57 recorder, which was used with Dragon Naturally Speaking 10.0 (voice recognition software) to transcribe interviews using the Voice Transcription Technique (Matheson, 2007). I listened to the interview using a headset, repeated the words into the microphone, and the words were transcribed with the voice recognition software.

All transcribed individual interviews were converted from Word documents into Rich Text Format and imported into MAXQDA for analysis. MAXQDA is user-friendly, offers a student discount, and helps to systematically evaluate and interpret texts and develop theories. I used coding techniques, wrote memos, highlighted text, and developed ideas using MAXQDA.

Three Phases of Coding

Grounded theory uses detailed procedures to analyze data, including three phases of coding: open (generating categories), axial (systematically developing and linking categories and subcategories), and selective (integrating and refining categories; Strauss & Corbin, 1998). Coding refers to "extracting concepts from raw data and developing them in terms of their properties and dimensions" (Corbin & Strauss, 2008, p. 159). It means thinking abstractly, setting aside preconceived expectations, and allowing the data to guide analysis (Corbin & Strauss). This systematic analytic method was originally developed by Strauss and Corbin (1998) and revised by Corbin and Strauss. The third edition of Corbin and Strauss was the primary guide for applying grounded theory in this study.

Open coding. This is a type of brainstorming that allows the researcher to open up the data to all potential possibilities and carefully consider various interpretations (Corbin & Strauss, 2008). It is a process that identifies properties and conceptualizes dimensions in the data which serve as the building blocks of theory. Basically, the data are broken down into discrete ideas and labeled with a meaningful name, including "in vivo codes" that are taken from the words of participants. I listened to the entire interview, transcribed it, read through it, and then went back to carefully review the text line-by-line to build categories, develop codes, and insert memos.

The process of open coding has been compared to working on a puzzle: the researcher organizes and sorts the pieces (during open coding) and builds a picture by putting the pieces back together (during axial coding; Strauss & Corbin, 1998). Codes are grouped into categories and themes. Categories are defined as a collection of similar data sorted into one place and allow the researcher to identify and describe characteristics of the studied phenomenon; whereas, themes are the meaningful essence that occurs frequently throughout the data and are described in the selective coding section (Morse, 2008). Lists or diagrams of categories are interrelated during axial coding.

Axial coding. Open coding continued and axial coding started by crosscutting or grouping codes into larger categories with the purpose of reassembling data from the open coding process (Strauss & Corbin, 1998). I identified one category as the central phenomenon or core category which was labeled *Commitment to Healthy Eating*, then identified causes, contextual conditions, intervening conditions, strategies, and consequences (Strauss & Corbin). The systematic design of grounded theory uses these six preset categories during the axial coding phase.

The core category represents the main theme or idea that is central to the process (Corbin & Strauss, 2008). It must meet several criteria, including being sufficiently abstract in order to be applied for research in other substantive areas, appearing frequently in the data, and having the ability to grow in depth and explanatory power relative to other categories (Corbin & Strauss).

Causal conditions refer to sets of events that influence the phenomenon (Strauss & Corbin, 1998). They can be thought of as the impetus for change or the set of circumstances that prompt an initial desire for behavioral change. For example, a woman makes the decision to join a weight loss program because her family expresses concern for her health.

Contextual conditions are sets of conditions that bring about problems or circumstances that influence the actions or strategies (Corbin & Strauss, 2008). These conditions provide the background setting. Examples of contextual conditions include the types of food a person grew up eating, the neighborhood she lives in, and her family traditions.

Intervening conditions occur during the process and mitigate the impact of causal conditions (Strauss & Corbin, 1998). "They are conditions that enter into the situation after the situation is in process to somehow affect what the person can or does and therefore the outcome"; an example of this would be someone in a smoking cessation program learning that a close family member is dying of lung cancer due to smoking (J. Corbin, personal communication, April 23, 2009).

Strategic actions refer to purposeful acts that resolve a situation or problem and shape the phenomenon (Strauss & Corbin, 1998). These actions or interactions are how an individual deals with the issue. All of the conditions and strategic actions lead to the consequences of being a maintainer or a non-maintainer. These conditions will be elaborated on in the subsequent sections.

Axial coding helps develop the theory by relating concepts to each other. Initial diagrams are formed during this phase to help sort out the interconnectedness among the categories (Strauss & Corbin, 1998). Please note that axial coding was presented as a separate chapter in earlier editions (Strauss & Corbin, 1998), in the 3rd edition, open and

axial coding are suggested as going hand in hand. The distinction between the two was for explaining the process to researchers (Corbin & Strauss, 2008).

I developed a preliminary axial coding diagram based on the open coding to axial coding diagram illustrated by Creswell (2005). I met with the co-interviewer and focus group note taker to discuss the preliminary diagram. In addition, I met with two members of the dissertation committee for feedback before continuing on to the third phase of selective coding. The open coding list of categories and the axial coding diagram was refined after making revisions suggested by the committee members and clarification provided through personal communication with Dr. Corbin.

The core category evolved from the data, was placed at the center of the axial coding diagram, and had the ability to pull together all other categories. Strauss and Corbin (1998) report six criteria for choosing the core category: (a) all categories must relate to it; (b) must appear frequently; (c) no forcing data; (d) sufficiently abstract so it can be used in other substantive areas; (e) with refinement the theory grows in depth and explanatory power; and (f) the concept holds even with varying conditions.

Selective coding. Finally, selective coding or final integration occurred after completing open and axial coding. Selective coding is "the process of integrating and refining theory" (Strauss & Corbin, 1998, p. 143). Integration is the process of "linking categories around a core category and refining and trimming the resulting theoretical construction" (Corbin & Strauss, 2008, p. 263). Please note that Strauss and Corbin (1998) used the term "selective coding" in the 2nd edition of their book, but use "integration" to describe the final step of theory building in the 3rd edition (Corbin & Strauss). This phase allowed us to build a story to fully connect categories and present a visual model.

Results

Open and Axial Coding

A total of 21 categories, including the core category, emerged from the data during the open coding phase. The core category, *Commitment to Healthy Eating*, was chosen to represent the main theme central to the process being studied because it met aforementioned criteria for a core category (i.e., abstract, applied to other areas, appeared frequently in the data, and explained other categories). The core category and subcategories, along with the other open and axial coding categories and their properties are shown in the Table 1. The table also includes dimensionalized examples with ranges for the properties, which provides variation to the theory.

Table 1. *Open Coding Categories with Properties*

Broad Categories	**Category or Subcategory**	**Properties or Dimensions**	**Dimensionalized Examples**	
Core Category: Commitment to Healthy Eating	Moderation	Portion control and balance	-Always choosing to control portion sizes -Indulging sometimes, avoid feeling deprived	-Never choosing to control portion sizes -Lose balance, all-or-none mentality
	Self-efficacy	Confident in one's ability to perform a given behavior	-High level of self-efficacy and control -Ability to control cravings	-Low level of self-efficacy and control -Uncontrolled eating of comfort foods
	Mindfulness of eating	Level of thinking about food choices, including hunger and caloric value of food	-Always eating mindfully, listening to body	-Mindless eating habits, disregard bodily cues
Causal Conditions	Health history	Personal and family background, including husband, children, and other relatives	-No history of weight problems or chronic conditions -Family encourages healthy behaviors	-Strong history of weight problems and chronic conditions -Family encourages unhealthy behaviors
	Health benefits	Reason for wanting to improve health	-To feel better for myself	-To feel better for someone else
	Physical Appearance: -Body size -Body image -Fit into clothing	-Actual size and shape of body -Perception of how your body looks -Fit of clothing	-Small shape, normal weight -Satisfied with body image -All clothes in wardrobe fit	-Large shape, overweight or obese -Dissatisfied with body image -Only certain clothes fit
Contextual Conditions	Childhood traditions	Types of food prepared by mother and lessons learned when young	-Prepared healthy foods, learned to sense satiety and stop eating	-Prepared unhealthy foods, learned to clean your plate
	Weight loss history	Type and frequency of weight loss attempts, level of success	-Many attempts -Quick fix diets -Unable to reach goal	-Few attempts -Lifestyle changes -Able to reach goals
	Cultural influence	Food patterns affected by ethnicity and Southern culture	-Strong cultural influence	-Weak cultural influence
	Obesogenic environmental factors: -Convenience and availability of food -Perceived cost	Work environment, exposure to fast food restaurants in neighborhood, amount of value placed on purchasing and preparing healthy foods	-More relaxed environment, limited exposure to fast food and junk food - High value placed on healthy foods	-Stressful environment, limited time for lunch, frequently exposed to fast food or junk food -Less value placed on healthy foods

Broad Categories	**Category or Subcategory**	**Properties or Dimensions**	**Dimensionalized Examples**	
Intervening Conditions	Personal stressors	Change in health status, for example recently diagnosed with chronic disease	-Develop positive attitude, try to improve self -Healthy lifestyle	-Develop negative attitude and give up -Engage in poor eating habits
	Perceived accountability	Sense of accountability to self and others	-Strong sense of accountability	-Weak sense of being accountable
	Interpersonal changes	Number of hours worked, change in marital status, perceived social support	-Work less hours or increased flexibility -Encouraged to continue eating healthy	-Work more hours, constantly rushed -Discouraged from eating healthy habits (e.g., "food pushers")
	Mindset	Awareness and evolving assessment of weight, changes in priorities	-Positive assessment, tired of struggling, but determined to stay committed	-Negative assessment, unsure of being able to continue making efforts to eat healthy
Actions and Interactions: Strategies	Planning	Plan meals, prepare food in advance, find out menu options before going to restaurant	-Always plan ahead	-Never plan ahead
	Adapting	Choosing to improve nutritional content of foods by making modifications	-Always modify food choices, even when out with friends or family	-Never change foods for any reason
	Monitoring	Frequency of checking weight, paying attention to body, keeping food journals	-Often monitoring weight, aware of changes -Food journals	-Rarely monitoring weight, unaware of bodily changes
	Resetting	Individual conditions for choosing when to get back on track after a lapse in eating healthy	-Quick reset (e.g., next meal or next morning with breakfast)	-Delayed reset (e.g., next week or no set plan)
Consequences	Maintainer	Maintain healthy lifestyle choices overtime	-Continue healthy eating habits -Manage weight	-Discontinue healthy eating
	Non-maintainer	Relapse into unhealthy eating behaviors	-Small lapses -Restart when ready	-Complete relapse into old behaviors -Regain weight

Theory Building

Selective coding or integration is the final step for building a theory. Using the path of maintainers and non-maintainers, we integrated the categories and developed a

theory, labeled *Commitment to Healthy Eating*. We discovered that women who remained confident in their ability to continue to apply strategies they learned during the *EatRight* program were able to maintain their weight over time. Key strategies included being mindful, practicing balance, implementing moderation, and staying vigilant. Mindfulness and listening to their bodies helped overcome emotional eating. Maintainers found a balance for staying on track, allowing for lapses, and realizing when it was time to get back on track. Other key concepts were practicing moderation and continuing to build confidence in staying committed to a healthy lifestyle.

All of the participants experienced a set of causal conditions that incited their desire to join a weight management program to help them lose weight through behavior modifications. In addition, all of the participants had a common bond of losing a clinically significant amount of body weight ($\geq$ 5%) during the program, but only some of them maintained their weight loss and healthy eating behaviors over time. Maintainers and non-maintainers reported similar causal, contextual, and intervening conditions; although, there were some notable differences between the groups, including mindfulness of eating and level of determination to continue. For example, maintainers were more aware of listening to their bodies and realizing when they needed to make changes.

Overall, women could not begin their *Commitment to Healthy Eating* unless they desired a change (i.e., making the decision to participate in a weight management program). Therefore, both maintainers and non-maintainers made a conscious decision to embark on the journey. However, their experiences after the program were dependent upon whether or not they remained committed to consistently making a healthy lifestyle their priority.

Women who continued eating healthy and maintained their weight over time consistently realized that their health was a priority. One maintainer stated:

> There was a time when I wanted to lose weight to look good, I wanted to have a more active social life, now I just don't want to die, I don't want to get some disease… now [I] would just like to be healthy.

Another maintainer expressed confidence in being able to make better choices:

> I'm gonna do what I know I should do no matter what…I can just help myself eat better to come off of the medications and can actually control those things from the inside, if I just eat the right things.

One maintainer noted how she incorporated lifestyle changes:

> It's just almost automatic and as a result of learning how to measure those things…how to read the boxes and turn them over…it's not a difficult thing to do, it's become a habit and I like it…so reading good labels has become just a regular part of life.

Non-maintainers exhibited a lower level of self-determination for remaining committed to their health and thus were unable to fully integrate healthy eating into their lifestyles. Some may have been considered partial maintainers since they exhibited

characteristics associated with maintainers and non-maintainers; for example, self-monitoring with a food diary with frequent junk food binges. In addition, a certain condition or event may have served as a trigger or tipping point to increase their level of determination and prompted them to reappraise themselves and revisit the idea of making healthy lifestyle changes.

Women who failed to maintain their weight over time reported that their intentions were there, but admitted finding excuses. For example, a non-maintainer stated:

> No matter what my intentions are I either don't have enough time to do it [prepare food] or I don't take the time to do it, which is probably more the truth.

Another non-maintainer explained how stress negatively influenced her:

> The stress of my kids getting in trouble at school, that just messes up my whole day… under a lot of stress makes me just not want to prepare a meal, it makes me just want to go home and go to bed.

One non-maintainer confessed that it was convenient to go to a fast food restaurant for dinner:

> The days are usually set because I have a regular schedule, I can always eat lunch, and breakfast, but I guess after work at night sometimes things can get crazy if I decide to go do something after work, dinner can get disrupted and we just have something that's easy to fix.

Establishing Credibility of Qualitative Data

In qualitative research, validating data refers to checking interpretations with participants and against the data as the research moves forward (Corbin & Strauss, 2008). Validation is part of the research process since the researcher needs to determine if the theory is accurate and makes sense to the participants (Creswell, 2008). Qualitative studies cannot be generalized, but they can provide explanatory power or predictive ability to explain what may happen in given situations (Strauss & Corbin, 1998). Methods to ensure transferability of results to similar settings included defining the sample with specific criteria, thoroughly describing their characteristics, and providing rich descriptions. Credibility is the qualitative version of internal validity; it measures how likely the study has accurately produced plausible findings from the data.

In this study, credibility was established using three verification procedures: triangulation, member checking, and peer debriefing (Corbin & Strauss, 2008). In addition, the data were checked with a dissertation committee audit. I met several times with the dissertation chair and a member of the dissertation committee with expertise in qualitative methodology (the 2nd author) to guide the study design, discuss open coding, axial categories, and reporting the findings.

Triangulation. First, the use of multiple data collection methods can be considered triangulation (Patton, 2002). The current study used two forms of data collection: focus groups and individual interviews. Data collection was carried out with multiple participants to present a multi-dimensional picture by amalgamating perspectives rather than only a single view. The combination of focus groups and interviews helps to overcome the intrinsic biases and problems associated with using a single method of data collection. For example, the focus groups allowed women to build upon each others' ideas and the individual interviews provided a private environment for disclosing sensitive information.

Member checking. Member checking was performed to help establish credibility. Member checking is the process of recycling findings to confirm and/or disconfirm interpretation of data and analytic categories among participants, including key informants from whom the data were collected (Crabtree & Miller, 1999). This was conducted by sharing findings with participants in two ways.

First, I emailed a one-page, bullet-point summary of the individual interview within two weeks following the interview to each participant and requested that she review the summary and let the researcher know if there was anything that needed to be changed or clarified. Twenty-one of the 23 participants (91%) confirmed that they received the summary and reported that it appeared accurate; the remaining 9% did not respond after being contacted twice. Corbin and Strauss (2008) report that other qualitative research has demonstrated limited feedback from participants. Therefore, a second type of member checking was used to encourage active feedback: all interviewed participants were invited to take part in the follow-up focus group to confirm the representativeness of the findings. Twelve participants (52% response) attended the follow-up focus group and freely shared their feedback. They concurred with the study findings from the individual interviews, which supports the likeliness that the data analysis accurately interpreted the intended meanings conveyed by participants.

Peer debriefing. The third verification tool was peer debriefing, which is when the researcher presents findings to peers to explore meanings and interpretations. This strategy was employed by sharing five randomly selected interviews with the co-interviewer and focus group note taker. The researchers met to discuss findings, clarify interpretations, and reach a consensus. In addition, I presented preliminary drafts of the axial diagram and theoretical model to two members of the dissertation committee and co-interviewer for feedback. This added credibility to the study by gaining perspectives from others who were closely involved in the process, which provided additional depth to the findings.

Discussion

The purpose of this grounded theory study was to understand the process of maintaining healthy eating behaviors for African American and Caucasian women who participated in a university-based weight management program. A goal of this study was to focus on individuals' experiences to formulate a theory that explained a process of

interactions involved in maintaining healthy eating behaviors over time and apply these findings to develop ideas for improving weight management interventions for women.

In the current study, a grounded theory methodology offered a systematic approach to data collection and analysis and emphasized the important role of the participants in sharing their experiences to develop a theory. Comparison of the current findings with published literature and theories can be used to stimulate theoretical sensitivity. For instance, Regulation Theory supports the idea that most self-regulation behaviors have the same basic set of elements, including standards, sensors, and comparisons, which activate change when a discrepancy is perceived (Carver & Scheier, 2001). This theory provides a possible explanation for why non-maintainers regained their weight: behavior change is not expected when individuals fail to notice their own behaviors or do not compare their behaviors with established standards. For example, non-maintainers may possess a different set of ideals for body weight or may have become conditioned to engage in unhealthy automatic reactions to food. Some research suggests that eating is an automated behavior in which individuals are unaware of the amount of food they consume and are oblivious to environmental cues (Cohen & Farley, 2008).

Limitations

Although individual interviews and focus groups can provide valuable insight into understanding the process of healthy eating after taking part in a weight management program, the study has several limitations. Bias is a potential limitation of recruiting participants from a range of dates since they completed various *EatRight* programs (i.e., Lifestyle classes, Medical Nutrition Risk Reduction Clinic, OPTIFAST® Clinic) at different times with different instructors and thus varying ranges of time to implement and maintain healthy eating behaviors. However, this inherent bias is offset by allowing women from a variety of experiences to participate in this study.

This sample may not be representative of the way that other *EatRight* participants or other groups of African American and Caucasian women who participated in different weight loss programs would describe their approach to healthy eating. Those who were interviewed may be more likely to view their participation in the program as a positive experience as opposed to who those who declined. As a result, information of factors that prevented them from maintaining healthy eating behaviors and its effect on weight management could not be captured. Several women reported that they were hesitant to schedule an individual interview because they had regained their weight and did not want to participate. For example, an email response from one woman that was contacted replied “I would not be a good choice for you. Even though I was extremely successful during my participation in the program, I was not able to maintain the weight loss…I will have to decline.”

Data collection may have been subject to recall bias and self-report bias associated with providing socially desirable responses (Petroczi & Nepusz, 2011). The participants may remember incidents differently since the retrospective questions focused on the time they participated in the program, which was at least one year or longer.

Another prospective bias may have been associated with the interviewers themselves. Interviewers and participants were matched on ethnicity: the researcher

interviewed Caucasian women and the research assistant interviewed African American women. Although both interviewers were doctoral-level public health students with similar training experiences and used the same interview protocol, it is possible that the participants may have responded differently if the same person interviewed all of them.

There may have also been a natural bias for maintainers to elaborate on more details. This was evidenced by their average interview time lasting seven minutes longer than the non-maintainers. In addition, the maintainers were on average almost five years older than non-maintainers. This may have influenced the results to have a positive bias associated with older age, which may be explained by additional life experiences, such as a higher number of weight loss attempts and number of times enrolled in a weight management program.

Finally, women who completed an individual interview were invited to attend the follow-up focus group; however, 11 participants were unable to attend due other commitments, including being out of town, attending class at that time, being sick, having a death in the family, and needing to be home for repair work caused by a storm the past week. One woman who had lost weight during the *EatRight* OPTIFAST® program and regained back most of the weight could not attend because she was having gastric bypass surgery the day before the focus group.

Implications

Implications from this study may include providing a framework for public health professionals to improve weight management programs, including weight maintenance and weight loss strategies. We found that women who were dedicated to maintaining their weight through healthy eating behaviors were able to succeed if they were adamant about making a long-term commitment to their health.

The current study used a grounded theory approach to formulate a theory, *Commitment to Healthy Eating*, which may be applied to compare and contrast findings in other substantive areas. Development of this theory is important because it expands upon the process of uncovering the meanings behind the lived experiences of a group of individuals, which may be helpful for improving weight loss programs. There is a need to identify best practices for weight management programs to reduce dropout, encourage adherence, and increase long-term success of dietary strategies that promote weight maintenance (Burke, Steenkiste, Music, & Styn, 2008).

This study complements the growing number of studies that focus on weight management and prevention of weight regain after completing a program. Clinicians, dieticians, and other health professionals who work with overweight and obese women need to recognize that eating patterns are related to the person on many levels, including personal factors, interpersonal relationships, and their environment. Findings from the current study provided evidence of influencing factors related to healthy eating behaviors, such as perceived accountability, level of mindfulness when eating, convenience of foods, and the amount of social support from family and peers. Healthcare professionals may apply this information to promote a commitment to health and sustained weight loss among individuals, such as evaluating the level of social support before a client starts a program (e.g., asking how many close friends, family members, and co-workers are aware that she joined the program).

Healthcare providers in weight management programs need to continue to help participants make permanent behavior changes by addressing their personal issues and food environment. Individuals may be more successful at continuing to stay consistent with healthy eating behaviors and avoiding weight regain if programs offer follow-up support and reinforce a high degree of accountability. Additional follow-up studies are necessary to explore the causal relationships among these factors.

Next steps in theory development for better understanding weight loss maintenance of women enrolled in structured weight management programs include addressing the relationship that exists between intervening conditions and actions taken to continue healthy behaviors. In conclusion, findings from the current study may be used to develop weight management interventions for women in several ways, including the implementation of a screening process. Weight loss studies have clearly shown high recidivism rates among women; unfortunately, many revert to unhealthy behaviors and often regain their weight.

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Article Citation

Zunker, C., & Ivankova, N. (2011). Applying grounded theory to weight management among women: Making a commitment to healthy eating. *The Qualitative Report, 16*(3), 860-880. Retrieved from http://www.nova.edu/ssss/QR/QR16-3/zunker.pdf