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Use of an Interactive Web-based Platform, Founded on Constructs from the Social Cognitive Theory, to Benefit Eating Competence

Matthew T. Moyer

Southern Illinois University Carbondale, mtmoyer12@yahoo.com

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USE OF AN INTERACTIVE WEB-BASED PLATFORM, FOUNDED ON CONSTRUCTS
FROM THE SOCIAL COGNITIVE THEORY, TO BENEFIT EATING COMPETENCE

By

Matthew T. Moyer

B.S., Canisius College, 1995
M.A., University of Alabama, 2004

A Dissertation
Submitted in Partial Fulfillment of the Requirements for the
Doctor of Philosophy Degree in Education

Department of Health Education
in the Graduate School
Southern Illinois University Carbondale
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DISSERTATION APPROVAL

USE OF AN INTERACTIVE WEB-BASED PLATFORM, FOUNDED ON CONSTRUCTS
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Approved by:

Dr. Stephen Brown, Chair

Dr. Peggy Wilken

Dr. Dhitinut Ratnapradipa

Dr. Barbara Hagler

Dr. Mike Perko

Graduate School
Southern Illinois University Carbondale
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AN ABSTRACT OF THE DISSERTATION OF

MATTHEW T. MOYER, for the Doctor of Philosophy degree in EDUCATION, presented on MARCH 7, 2014, at Southern Illinois University Carbondale.

TITLE: USE OF AN INTERACTIVE WEB-BASED PLATFORM, FOUNDED ON CONSTRUCTS FROM THE SOCIAL COGNITIVE THEORY, TO BENEFIT EATING COMPETENCE

MAJOR PROFESSOR: Dr. Stephen Brown

Since Web-based interventions have a significantly high rate of attrition ranging from 99.5% to 77.5%, the researcher employed an instrumental case study approach to understand compliance in a Web-portal. The specific issue for this study was attrition rates and how SCT constructs affected eating competence. Qualitative data provided ground zero insight to a complex issue that was further understood.

To better understand the phenomenon, participants that registered for the 30-day study and the software developer were interviewed. All interviews (n=6) were transcribed and data from the transcriptions were transformed from dialogues, into categories, then themes, and finally into concepts. Five guidelines to keep attrition rates low was the outcome of the data analysis.

Having a nation interested in the Internet and at the same time faced with an obesity epidemic seemed to be a good fit for researching a method to promote eating competence with interactive technology. Eating competence intertwines four components: (1) attitudes about eating and the enjoyment of food (2) accepting new food to add variety to your diet (3) being able to eat the right amount of food and (4) being able to manage food through proper planning, storing, preparing, and offering. With the above information extracted from the literature, it was determined, a serious enough problem existed to justify spending time, money and other resources to develop and implement an intervention.

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The theoretical framework supporting the development of the web portal is the social cognitive theory (SCT). In health promotion, the purpose of the SCT is to help people stay healthy through good self-management of health habits. This dissertation focused on four constructs: self-efficacy, behavioral capabilities, observational learning, and reinforcement to better understand how eating competence skills were enhanced and attrition rates lowered.

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INTRODUCTION

Statistical Data: Obesity rates, Financial Impact, and Internet Use

Obesity Rates

"Diet is associated with five of the 10 leading causes of death in the U.S., including coronary heart disease, certain types of cancer, atherosclerosis, and type 2 diabetes (Schulman & Wolfe, 2000, p.107)." Due to the diet of Americans, over the past 20 years, the rates of obesity in the United States have been increasing at a steady rate to the point where 33.8% of U.S. adults and approximately 17% of children and adolescents are obese (U.S. Obesity Trends, 2011). A snap shot of obesity prevalence in the United States is displayed in Figure 1 where 36 states have 25% or more of their population with a BMI of 30 or greater (U.S. Obesity Trends, 2011). BMI is calculated from a person's weight and height and provides a reasonable indicator of body fatness and weight categories that may lead to health problems (Centers of Disease Control and Prevention, 2010).
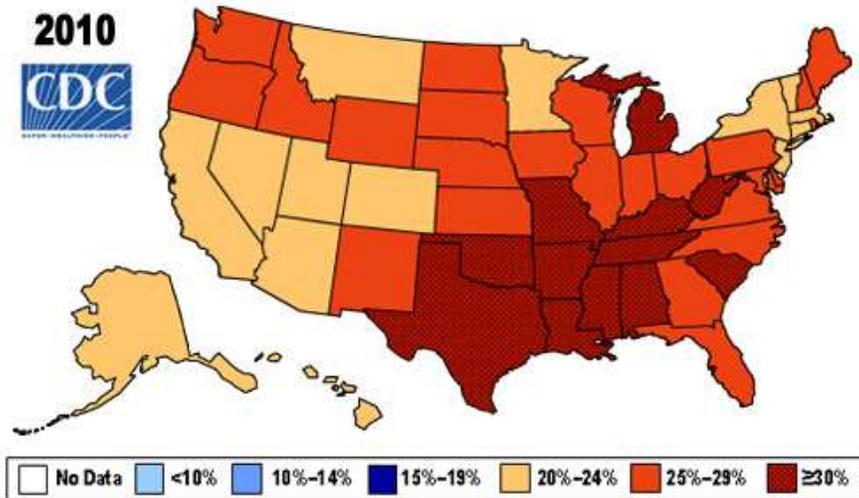
Adopted from *U.S. Obesity Trends*. (2011, July 21). Retrieved September 4, 2011, from Centers for Disease Control and Prevention: http://www.cdc.gov/obesity/data/trends.html

Figure 1. Percent of obese (BMI $\geq$ 30) in U.S. adults

Financial Impact

To conceptualize the financial impact of an American's diet enabling obesity, a report in 2007 indicated the United States spent close to $2.3 trillion on health care and this figure is expected to increase to reach an estimated total of $4.3 trillion by the year 2017 (Lustria, Cortese, Noar, & Glueckauf, 2009). To contend with the above projection, quality health promotion programs implementing innovative and purposeful technology to accommodate diverse settings and environments remains an important public health goal (Linnan, et al., 2008).

Internet Use

Individuals, families, communities, educational institutions, and workplaces perceive the Internet as a means of information. From 1997 to 2009, rates of Internet use in the household have increased from 18% to 68.7% (Computer and Internet Use, 2009). Evers (2006) and Cook,

Billings, Hersch, Back, and Hendrickson (2007) reported 33% of the United States population is connected to the Internet through a broadband connection, while 44% is connected through a dial-up connection, and 22% are off-line or non-users. These proportions indicate 77% of Americans are connecting on-line with access to the World Wide Web (WWW) for information. A percentage of households with Internet access have remained the same according to the 2009 Current Population Survey (CPS) from the U.S. Census Bureau on Computer and Internet Use (Computer and Internet Use, 2009). What has changed is the mode in which the Internet is delivered to the household. According to the 2009 CPS on Computer and Internet Use, 63.5% of households use a broadband connection, 4.7% use a dial-up connection, and 0.4% use other forms of Internet connection.

Overview of Literature

      ecSatter

As a nation with an obesity epidemic (U.S. Obesity Trends, 2011) and an interest in the Internet (Computer and Internet Use, 2009), researching a method to gain eating competence with interactive technology, theoretically, seems to be a good fit. According to Satter (2007a), "Eating is a complex process made up of learned behavior, social expectations, acquired tastes, and attitudes and feelings about eating in general and about certain food items in particular" (p. S142). Eating competency intertwines four components: (1) attitudes about eating and the enjoyment of food; (2) accepting new food to add variety to your diet; (3) being able to eat the right amount of food; and (4) being able to manage food through proper planning, storing, preparing, and offering (Krall & Lohse, 2011). Taking the perspective that eating is based on food-related behaviors and attitudes is the foundation for the Satter Eating Competence Model (ecSatter) (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007).

The ecSatter is a model where eaters are confident, comfortable, and flexible with eating (Satter, 2007). Individuals who are eating competent are second nature to the task of being able to get a satisfying amount of food that is enjoyable to eat and nutritious (Satter, 2007a). Unlike the *Dietary Guidelines* or *MyPyramid*, food restrictions are not a part of the ecSatter model (Satter, 2007b). Interventions employing the ecSatter Model are not based on the complexity of the problem, but on the level of services that can be delivered (Satter, 2007b).

Social Cognitive Theory Constructs.

The social cognitive theory (SCT) covers a wide range of issues including motivation and behavior (Bandura, 1986). For this study, constructs from the SCT were the foundation for developing the content for the experimental group. Content for the experimental group was informational-based material and a myriad of activities designed around the constructs of the SCT. Self-efficacy was the overarching construct addressed in this study with support from the following constructs: behavioral capabilities (practice), observational learning experiences, self-regulation, emotional arousal, outcomes expectancies/expectations, and reinforcement. Since the SCT is a broad behavioral theory (Bandura, 1986), it was a challenge to manipulate all constructs within an on-line environment. For this study, the constructs from the SCT were used concurrently in support of encouraging eating competence; however, a majority of the content was developed based on the constructs of behavioral capabilities, observational learning, and reinforcement.

To promote eating competence, the literature revealed printed material programs, programs that target a behavior and/or population, programs that are tailored, programs that are Web-based, and programs that are a combination of all these options, have the potential to be efficient and effective (Lustria, Cortese, Noar, & Glueckauf, 2009; Wantland, Portillo,

Holzemer, Slaughter, & Mcghee, 2004). Regardless of the program design, personalization of the program is where the individual was engaged, build self-efficacy, and improve health behaviors (Lustria, Cortese, Noar, & Glueckauf, 2009).

Web-based vs. Non-Web-Based Interventions

In a quest to extend the knowledge on Web-based interventions, the researcher reviewed a meta-analysis addressing the phenomenon of Web-based health interventions and found research had been conducted to explore Web-based interventions versus non-Web-based interventions (Wantland, et al., 2004). Research conducted by Wantland et al. (2004) analyzed effect size comparisons between Web-based interventions and non-Web-based interventions. A meta-analysis indicated Web-based interventions were significant in changing an individual's behavior or in achieving specified knowledge (Wantland et al., 2004). Printed material does have an impact on changing behaviors however, with the impact technology plays on an individual obtaining information and skills, Web-based interventions accommodate the needs and expectations of our society (Lustria, Cortese, Noar, & Glueckauf, 2009; Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004).

For a Web-based intervention to be successful, there must be a sound theoretical framework. Literature on Web-based interventions demonstrated a consistent trend in the use of Bandura's social cognitive theory (SCT) (Bernhardt, 2001; Cook, Billings, Hersch, Back, & Hendrickson, 2007; Oenema, Brug, & Lechner, 2001; Ornes & Ransdell, 2007). Social cognitive theory has been used as a theoretical framework to change behavior in skin cancer (Bernhardt, 2001), physical activity (Ornes & Ransdell, 2007), and nutrition education (Oenema, Brug, & Lechner, 2001) interventions. The SCT constructs that guided the theoretical framework for the above mentioned studies were self-efficacy (Bernhardt, 2001; Ornes & Ransdell, 2007),

observational learning (Cook, Billings, Hersch, Back, & Hendrickson, 2007), reinforcement (Ornes & Ransdell, 2007), outcome expectations (Ornes & Ransdell, 2007), outcome expectancies (Bernhardt, 2001), and behavioral capabilities (Ornes & Ransdell, 2007).

The above-mentioned and other valid and reliable research has enabled Web-based interventions to progress to a tailored design (Bernhardt, 2001). A tailored intervention allows messages to be delivered based upon the individual's needs, characteristics, and preferences (Bernhardt, 2001). Tailored messages are geared to influence an individual's cognitive process based on educational strategies (Kukafka, Lussier, Eng, Patel, & Cimino, 2002). However, educational strategies are limited in tailored Web-based interventions. Even though there is mention in the literature of developing decision-making skills (Kukafka, Lussier, Eng, Patel, & Cimino, 2002) and self-management (Bandura, 1998), a review of the literature indicated minimal to no report of Bloom's Taxonomy or Healthy People 2010. Since the goal of this study was to change, maintain, and transfer behavior, it is interesting that the fore mentioned resources are not considered in a tailored Web-based intervention.

Food Consumption

The concern about obesity taking over our nation is a high priority in our society. "Obesity is now regarded as a global epidemic affecting both adults and children, and is associated with significant morbidity and mortality" (Crowley, 2008, p. 245). Finding a means to reduce obesity rates through effective management is a clinical focus (Crowley, 2008). To manage an individual's food consumption, a clear understanding of an individual's appetite, satiety, and food intake will be necessary to develop effective interventions (Crowley, 2008).

In an effort to understand food consumption, Glanz, Basil, Maibach, Goldberg, & Snyder (1998) examined food choices based on taste, nutrition, cost, convenience, and weight control.

What is happening is individuals gravitate towards foods that they like and give them pleasure (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). With so many convenient high fat foods filled with preservatives, there is an even greater challenge to manage food consumption and control the epidemic rates of obesity.

In a study with preschoolers, Johnson (2000) focused on examined food choices based on taste, nutrition, cost, convenience, and weight control. The study indicated a child's food consumption is regulated by parental eating habits (Johnson, 2000). Cues can be provided to help children focus on internal signals, such as recognizing when they have had enough, and improving their ability to amend food consumption and gain eating competence (Johnson, 2000; Satter, 2007a). Indicating that if parents are able to model proper food consumption and eating competency skills there is the potential for the child to display the same behavior (Johnson, 2000; Satter, 2007a).

Promoting positive food consumption through parents whom model proper food consumption skills may be a cumbersome task. In a study by Hovland, McLeod, Duffrin, Johanson, & Berryman (2010), the proper nutrient level and food group recommendations for children indicated by *My Pyramid* are not being met. A reason for not meeting the proper nutrient level and food group recommendations is due to restrained eating (Satter, 2007b). Basically, people do not want to give up food they like and there is a perspective that eating healthy takes too much time (American Dietetic Association, 1997). So, students in the study are seeking foods that are filled with sugar and fats, thus replacing healthy foods that are identified in the main food groups (Hovland, McLeod, Duffrin, Johanson, & Berryman, 2010).

Adding to the mix of variables that influence food consumption is demographics. Demographics include gender, race, income, and educational levels of a population. Glanz et al.

(1998) referred to studies by Kristal et al. (1995) and Glanz et al. (1994) indicating demographics have an impact on an individual's taste, nutrition, cost, convenience, and weight control. Concluding, the food choices people make depend on surroundings, exposure to a variety of foods, and social economic status (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Satter, 2007a).

Statement of the Problem

Rationale for this study is to build from the previous research regarding Web-based health education interventions. A driving force for this study is the alarming rate of obesity and the financial burden obesity has had on our country. Employing the ecSatter Model, this study extended the research to produce new knowledge about how a Web-based platform can be a viable means for gaining eating competence and building social cognitive skills. A Web-based platform provided the infrastructure, programming, and functionality needed to operate a website on the Internet (Chemla, 2011). Guidelines from the ecSatter Model and constructs from the SCT were the foundation for this study to determine the impact of a Web-based intervention on eating competence.

Purpose for the Study

Research indicates Web-based interventions were significant in changing an individual's behavior or in achieving specified knowledge (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004). However, high attrition rates are associated with a Web-based study (Eysenbach, 2005). The purpose of this study was to analyze the qualitative aspects needed for a sustained behavioral change utilizing a Web-based intervention. The study exposes the human part of the phenomenon and focuses on attrition rates to better understand compliance when employing a web-portal (Jacob & Furgerson, 2012) (Creswell, 2007).

This study was theory-based to find out how future wellness programs can be designed employing constructs from the Social Cognitive Theory (SCT) and a Web-based platform. The findings of this study have become a foundation to conduct future research on methods that will promote enjoyable and interactive activities to sustain a behavioral change using a Web-portal. By keeping the interventions grounded in theory and engaging, the expectation is attrition rates for Web-based interventions will decrease.

Content for the Web-portal focused on four areas of eating competence and was based on the ecSatter Model. Through semi-structured interviews, the study probed participants to determine the magnitude the ecSatter Model and the SCT had towards gaining eating competence, thus adding another layer of knowledge to the literature. Tailored information and Web-based activities to promote eating competence were placed in a four-section wheel. When activated, each section or channel of the wheel opened and provided a variety of content to promote growth. In 2003, Berg, Oenema, and Campbell indicated further research was needed to understand how tailoring impacts "multiple health related behaviors based on different sources and/or communicated through different channels" (p.1033S).

Significance to Health Education

Web-based interventions are increasing in popularity. However, websites delivering the Web-based interventions are not valid or reliable (Evers, Prochaska, Prochaska, Driskell, Cummins, & Velicer, 2003). By presenting findings instrumental to health education, the discipline can continue to grow and be recognized as a valuable resource to the health industry and community settings.

Furthermore, with the wellness of our nation on a decline and Internet use on an incline, the population of the United States is going to depend more and more on health educators to

prescribe Web-based interventions that will develop an individual's skill to change a behavior. This study took a proactive step to address the obesity epidemic by developing a Web-based platform designed to build eating competence skills. A positive change in eating competence skills indicates a behavioral change took place, thus opening the doors to designing future Web-based platforms. Future Web-based platforms will address the other aspects of health, eventually leading to one Web-based platform that enables all aspects of health to intertwine and promote positive behavioral changes. Successes in behavioral changes endorse the value of the health education discipline in our society.

As technology continues to develop, a Web-based platform specific to health promotion can be significant in the community setting, school setting, workplace setting, and hospital setting. By using a network of servers that communicate with various databases, programs can be implemented in a variety of settings with content that is specific to the population's needs. Once assessed, individuals will have an interactive means to improve self-management skills. Through a reflective process on the health areas that need to be addressed, individuals can set reasonable and attainable goals that will meet desired outcomes. As goals are being achieved, individuals will be inspired by rewards and incentives. When barriers are faced, individuals have a social network available to get past challenging tasks.

Since the Web-based platform functions on databases, information is stored and retrieved. Health educators are able to conduct formative assessments and run statistical analysis to gain information on the outcomes of the program. Based on the information changes can be made that does not interrupt the flow of the program. The end results are methods that assist in an individual having a better quality of life.

Qualitative Research Question

To handle high attrition rates and gain a deeper understanding on how constructs from the SCT influence eating competence, the overarching qualitative question becomes; what is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change? To support the overarching qualitative research question the following sub questions exist: (1) What activities/content in the Web-portal had the most impact? (2) What activities/content in the Web-portal had the most influence? (3) How do participants stay motivated when engaged in a Web-based eating competence program? (4) What type of content is needed in a Web-portal to produce a sustained behavioral change? (5) What makes the Web-portal easy to navigate? (6) What functionality needs to be included in a Web-portal to produce a behavioral change? (7) How can the development of an eating competence Web-portal stay within the budget?

Research Design

Demographics

To be eligible for the study, participants met three criteria: (1) the participants were 18 years of age and a resident of the township. A terms and condition agreement was used to verify eligibility; (2) the participants had access to the Internet and a technological device (i.e., desktop computer, laptop computer, tablet, netbook, or phone) supporting an operating system where the individual could interact with the website; and (3) the participant was interested in developing eating competence.

In the Town of Pittsford, NY, a total of 22,612 residents 18 years and older were available for the study (About Pittsford, 2011). Since response rate can range from 114 (0.5%) to 7,914 (35%) participants (Eysenbach, 2005; Kittleson, 1997), registration for the study was

expected to remain open until power at .80 is attained. To attain power at .80, 104 plus participants, a minimum of 52 participants in each group, were slated to complete the intervention (Faul, Erdfelder, Lang, Buchner, 2007).

Instrumental Case Study

Since Web-based interventions have a significantly high rate of attrition ranging from 99.5% to 77.5% (Eysenbach, 2005), the researcher employed an instrumental case study approach to understand compliance in a Web-portal. According to Creswell (2007), an instrumental case study is when the researcher focuses on a specific issue. The specific issue for this study is attrition rates and how SCT constructs affected eating competence. Collecting qualitative data provided a better understanding of the phenomenon. (Neutens & Rubinson, 2002). Qualitative data provided ground zero insight to a complex issue that was further understood (Creswell, 2007). To better understand compliance, questions regarding the use of the portal provided the researcher with a deeper and richer understanding of the interface and functionalities needed to promote a sustained behavioral change.

Through semi-structured questions, the researcher sought a greater understanding of the process that took place during the intervention. Inquiries into the perceptions the participant had about the site were explored. To do this, a purposeful sampling strategy was employed (Creswell, 2007). Interviewees were participants whom completed the intervention, registered and participated but did not complete the intervention, and participants that registered and did not actively participate in the study. The interview sought to understand the feelings, emotions, and thoughts of the participants to gain a better perspective on what modifications need to be addressed so the web portal can meet the greater needs of future participants.

Since the focus of the research was on the impact of a Web-portal to make a sustained behavioral change, the format of a semi-structured interview provided the opportunity to analyze the process (Cohen & Crabtree, 2006). To ensure reliable and comparable qualitative data was collected, the researcher produced three interview guides that had clear directions and consisted of open ended questions (Cohen & Crabtree, 2006). Since the interview was semi-structured, the interviewer obtained the participants' perspectives on the process involved in navigating the Web-portal, which will aid in the development of an improved web-portal (Neutens & Rubinson, 2002).

Data Collection

Collection of data took place in a suburban community in Monroe County, New York. Interest in the study was generated by word-of-mouth and a handout. The handout was placed in various business locations and provided all the necessary information about the study (see appendix E). Before handouts were distributed, permission to visit each business was granted by the mayor of the village. Individuals who participated in the study were asked to register and interact in a Web-portal to foster eating competence for 30-days. Participants 18 years and older were solicited and age was verified by a terms and conditions agreement.

Instrumentation

To measure eating competence of participants, the researcher implemented Satter's ecSatter Inventory (ecSI) (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007; Stotts & Lohse, 2007). Validated in a large sample from the general population (N=863), construct dimensionality and validity were confirmed by factor analysis and comparison to validated instruments (Stotts & Lohse, 2007). The 16-item ecSI questionnaire is designed to empirically assess the constructs of the ecSatter Model (Lohse, Satter, Horacek, Gebreselassie, & Oakland,

2007; Satter, 2007). Based on functional eating attitudes and behavior (Satter, 2007), the four constructs are as follows: (1) eating atitudes (2) food acceptance (3) internal regulation and (4) contextual skills (Stotts & Lohse, 2007).

Data Analysis

To expose the human part of the phenomenon (Jacob & Furgerson, 2012), the researcher incorporated an instrumental case study approach. To better understand compliance and attrition rates, the interview process took place. Semi-structured questions were the foundation for the six interviews. Interviews were recorded using a QuickTime Player version 10.2 on a MacBook Pro, OS X, version 10.8.5. When the interview was complete, the file was exported and saved as either an audio file or a movie file. Each file was saved on the internal drive of the MacBook Pro, an external drive, and a remote server. Each interview group had a separate interviewing guide, but all three groups had the same overarching question, "What is your idea of a Web-based eating competence program that will assist you in making a sustained behavioral change?"

The protocol for transcription was as follows: (1) locate the audio or movie file; (2) open the file in iTunes (audio) or QuickTime Player (movie); (3) listen to the interview; and (4) create a transcript of the conversation in a Microsoft Word document. MacBook Pro is equipped with a dictation and speech application. There was an attempt to use the dictation and speech application to assist in the transcription of the interviews. Instead, the researcher played portions of the recording, transcribe, review the transcription for accuracy, and then continue with the next portion of the interview.

When the transcriptions were complete, coding began. In a Word document, the researcher used the landscape orientation and created three columns using the *Tables* function from the Microsoft Word toolbar. Each transcript was coded separately and the next transcription

was not coded until the prior transcript was completed (Saldana, 2009). With all transcripts coded, inductive reasoning continued and the attributes were conceptualized. Data analysis extracted the major elements of each interview to disclose themes that are significant attributes to the overarching/specific issue of attrition rates in an eating competence web-based portal.

Limitations

- Participants were encouraged to be actively involved in the study on a daily basis. Attrition rates for the study as a whole and both websites were monitored closely to make sure participants were using the assigned Web-based intervention to develop skills that developed eating competence. Since attrition rates were expected to be high, the length of the web pages were short and attractive, load time for the web pages were as quick as possible, and activities seemed to be engaging (Frick, Bächtiger, & Reips, 2001).

- Since each individual knew he/she was participating in the study, social desirability was at stake (Frick, Bächtiger, & Reips, 2001). Individuals may have reported certain behaviors that will favor their results. For example, an individual may have reported they had five serving of fruits or vegetables when they only had three or four servings. The individual may not have wanted to portray him/herself as a poor eater. Reporting of incorrect values was a major threat to internal validity (Dignan, 1995; Dimitrov & Rumrill, 2003). To control for social desirability, 13-items from Crowne and Marlow Social Desirability(CM) Short Form C was intertwined to the ec Satter Inventory.

- The Hawthorne Effect was a limitation because individuals may change their typical behavior due to the existence of the study (Neutens & Rubinson, 2002). Due to this condition, results may have been better than anticipated. The person may have been more conscious than usual in eating competence. For instance, a participant in the control group

may have been motivated by the information acquired from the website; a high level of
interest could have lead to the development of a reward system to extend skill development.

- With being more conscious of having eating competence and building the skills necessary to
make the change, there was the potential for other behavioral changes to surface. For
example, by gaining eating competence, positive results may have excited the participant
about making other behavioral changes. This indirect behavioral change was not anticipated,
but because of the study, the chance to change another behavior emerged.

- A behavior change in another health area may have potentially been the result of
confounding variables. With obesity, being an epidemic in our country, individuals may have
been more conscious of their eating habits and may have already started a regulating
regimen. An individual could have just completed an annual physical exam and may have
been in the process of trying new foods that are healthier and managing meals was a change
the individual was already making.

- Each participant may have been wondering how the other participants were gaining eating
competence. Due to this conscious behavior, participants may have picked the pace up a bit
more than usual. This action is known as the John Henry Effect (Issac, 1995).

- The study was scheduled to remain active until the end size reached (104 individuals, 52
individuals for the control group and 52 individuals for the experimental group). There was
the possibility that not all participants would complete the intervention in the same month.
Since participants may have potentially finished the study in different intervals there could
have been an impact on history and/or maturation (Dignan, 1995).

- Depending on the professional career of the sample population, a professional in the wellness
field could have been a part of the study. A participant with a health background may have

been at a higher health promotion level. The impact was the gain score from the pretest and posttest that had the potential to show a significant change.

The above-mentioned limitations were scheduled to have an impact on the results of the study. The expectation was that each individual was to maintain his/her normal behavior and respond to the intervention in an objective manner.

Delimitations

- The target population, sample population, independent variables, and dependent variables, constructs from the SCT, the instrument, and the statistical analysis were all decided upon by the researcher. The sample of the study was individuals who were attempting to gain the skill of eating competence.

- As a part of the intervention in this study, participants were directed to monitor their food consumption and amend their current behaviors with the intentions of increasing eating competence. A delimitation of the study was participants were willing and ready to change the way they eat. The problem that will exist was the participant's subjective norms and perceived behavioral control. The intervention for the experimental group and the control group was designed to capture the participant's interest and motivate the individual to be actively engaged at a high level.

Assumptions

It is expected that each individual responded honestly and appropriately to the directions of the study. It is assumed participants maintained their initial perspectives and subjectivities and refrained from alternative behaviors due to the knowledge of being a participant in a research

study. An additional assumption is each participant had a positive attitude towards the intended

behavioral change.

Definitions

Amending food consumption: a global term referring to the ending of an eating episode

(satiation) and being able to set aside eating (satiety) for nutritional improvements.

Behavioral capability: obtaining the knowledge and skill to perform a given behavior

(Baranowski, Perry, & and Parcel, 2002).

Body mass index (BMI): calculated from a person's weight and height and provides a reasonable

indicator of body fatness and weight categories that may lead to health problems (Centers of

Disease Control and Prevention, 2010).

Dosage: for this study the participant logged on four different days within the first seven days

and complete at least three activities on the site during each login session.

Eating competence: the internal regulatory process of monitoring and managing hunger, appetite,

and satiety (Satter, 2007a).

Internet: "an electronic communications network that connects computer networks and

organizational computer facilities around the world" (Internet, 2011, para. 1).

Observational learning: the action of watching a behavior and then acquiring the traits to initiate the observed behavior (Baranowski, Perry, & and Parcel, 2002).

Reinforcement: can be positive or negative and is the participant's response to a behavior that increases or decreases the likelihood of the behavior (Baranowski, Perry, & and Parcel, 2002).

Self-efficacy: the confidence a participant has in performing a behavior and overcoming barriers to that behavior (Baranowski, Perry, & and Parcel, 2002).

Tailored health communication: a message strategy used to provide specific content to individuals based upon data they have provided, typically responding to a theory driven assessment of behavior (Kreuter & Wray, 2003).

Targeted health communication: a message strategy intended to reach some population subgroup based on characteristics presumed to be shared by the group's members (Kreuter & Wray, 2003).

Web-based health intervention: a program delivered by the World Wide Web designed to change a particular behavior.

Web-based platform: the infrastructure, programming, and functionality needed to operate a website on the Internet (Chemla, 2011).

World Wide Web (WWW): "a part of the Internet accessed through a graphical user interface and containing documents often connected by hyperlinks —called also *Web"* (World Wide Web, 2011, para. 1).

Summary

Our culture and society is immersed in an environment that advocates for eating competence. However, our society has epidemic rates of obesity and an upcoming generation plagued with the notion they will have a lower life expectancy than their parents will. By understanding eating competence and the skills needed to gain eating competence the ability to monitor food consumption at a satiety level will provide the upcoming generation with an environment that is conducive to proper eating habits and the potential to suppress obesity.

To enable a nation to be more equipped with the skills to eat properly, guidelines modeled after the ecSI were presented in a Web-based interventions. Due to high attrition rates, statistical significance was determined to be unattainable. Instead, an instrumental case study was implemented to learn more about lowering attrition rates in an eating competence Web-portal. The sample population was from a town in the county of Monroe located in New York State. The primary quest was to produce an answer to the overarching research question, *what is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change?*

CHAPTER 2

LITERATURE REVIEW

Overview

An individual's wellness is composed of physical, intellectual, interpersonal, spiritual, environmental, and emotional dimensions (Insel & Roth, 2008). These six dimensions are interrelated and facilitate an individual's optimal health or wellness (Insel & Roth, 2008). To advance to a state of wellness, positive lifestyle decisions need to be made about the way an individual lives (Insel & Roth, 2008).

Health promotion is a means to make positive lifestyle decisions.

"Health Promotion is the art and science of helping people discover the synergies between their core passions and optimal health, enhancing their motivation to strive for optimal health, and supporting them in changing their lifestyle to move toward a state of optimal health" (O'Donnell, 2009, p. iv).

For a lifestyle change to occur, an individual needs to enhance awareness, change day to day practices, and create environments that support good health practices (O'Donnell, 1989).

Awareness to eating competence, to maintain a healthy weight, is an example of a lifestyle change that continues to challenge our nation. In the United States, an annual estimate of medical expenditures attributed to obesity is estimated at $75 billion (Finkelstein, Fiebelkorn, & Wang, 2004). Being overweight or obese is a result of behavioral, environmental, and genetic factors (Culos-Reed, Doyle-Baker, Paskevich, Devonish, & Reimer, 2007).

A resource that is becoming readily available to a vast majority of our nation with the ability to enhance awareness to eating competence is the Internet. The Internet is defined as "an electronic communications network that connects computer networks and organizational computer facilities around the world" (Internet, 2011, para. 1). It is a popular source for information and communication where information can be accessed to provide decisions on food

consumption. Eighty-six percent of adult Internet users are using the Internet as a resource to gather information on health care or a specific disease (Evers, Prochaska, Prochaska, Driskell, Cummins, & Velicer, 2003; Harris Interactive, 2001). The materials gathered from health related websites are directly influencing the individual's decision about receiving care and treatment (Evers, Prochaska, Prochaska, Driskell, Cummins, & Velicer, 2003).

Individuals, families, communities, educational institutions, and workplaces perceive the Internet as a means of gaining information. From 1997 to 2009, Internet use in the household had increased from 18% to 68.7% (Computer and Internet Use, 2009). Evers (2006) and Cook, Billings, Hersch, Back, and Hendrickson (2007) reported 33% of the United States is connected to the Internet through a broadband connection, while 44% is connected through a dial-up connection, and 22% of Americans are off-line or non-users. Meaning, 77% of Americans are connecting on-line with access to the World Wide Web (WWW) for information. Percentages of households with Internet access have remained the same according to the 2009 Current Population Survey (CPS) from the U.S. Census Bureau on Computer and Internet Use (Computer and Internet Use, 2009). What has changed is the mode the Internet is delivered to the household. According to the 2009 CPS on Computer and Internet Use, 63.5% of households use a broadband connection, 4.7% use a dial-up connection, and 0.4% use other forms of Internet connection.

Purpose for the Study

Research indicates Web-based interventions were significant in changing an individual's behavior or in achieving specified knowledge (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004). However, high attrition rates are associated with a Web-based study (Eysenbach, 2005). The purpose of this study was to analyze the qualitative aspects needed for a sustained

behavioral change utilizing a Web-based intervention. The study exposes the human part of the phenomenon and focuses on attrition rates to better understand compliance when employing a web-portal (Jacob & Furgerson, 2012) (Creswell, 2007).

This study was theory-based to find out how future wellness programs can be designed employing constructs from the Social Cognitive Theory (SCT) and a Web-based platform. The findings of this study have become a foundation to conduct future research on methods that will promote enjoyable and interactive activities to sustain a behavioral change using a Web-portal. By keeping the interventions grounded in theory and engaging, the expectation is attrition rates for Web-based interventions will decrease.

Content for the Web-portal focused on four areas of eating competence and was based on the ecSatter Model. Through semi-structured interviews, the study probed participants to determine the magnitude the ecSatter Model and the SCT had towards gaining eating competence, thus adding another layer of knowledge to the literature. Tailored information and Web-based activities to promote eating competence were placed in a four-section wheel. When activated, each section or channel of the wheel opened and provided a variety of content to promote growth. In 2003, Berg, Oenema, and Campbell indicated further research was needed to understand how tailoring impacts "multiple health related behaviors based on different sources and/or communicated through different channels" (p.1033S).

Qualitative Research Questions

To handle high attrition rates and gain a deeper understanding on how constructs from the SCT influence eating competence, the overarching qualitative question becomes; what is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change? To support the overarching qualitative research question the following sub

questions exist: (1) What activities/content in the Web-portal had the most impact? (2) What activities/content in the Web-portal had the most influence? (3) How do participants stay motivated when engaged in a Web-based eating competence program? (4) What type of content is needed in a Web-portal to produce a sustained behavioral change? (5) What makes the Web-portal easy to navigate? (6) What functionality needs to be included in a Web-portal to produce a behavioral change? (7) How can the development of an eating competence Web-portal stay within the budget?

Gaining Eating Competence to Meet the Needs of the Population

The concern of obesity taking over our nation is a high priority in our society (U.S. Obesity Trends, 2011). "Obesity is now regarded as a global epidemic affecting both adults and children, and is associated with significant morbidity and mortality (Crowley, 2008, p. 245)." Since obesity is a global epidemic, finding a means to reduce obesity rates through effective management is now a clinical focus (Crowley, 2008).

Satter Eating Competence Model

According to Satter (2007a), "Eating is a complex process made up of learned behavior, social expectations, acquired tastes, and attitudes and feelings about eating in general and about certain food items in particular" (p. S142). Being able to manage a variety of foods in adequate amounts to meet the needs and stresses of life is a cumbersome task (Satter, 2007a). One strategy to manage food consumption is called eating competence. Eating competence intertwines four components: (1) attitudes about eating and the enjoyment of food (2) accepting new food to add variety to your diet (3) being able to eat the right amount of food and (4) being able to manage food through proper planning, storing, preparing, and offering (Krall & Lohse, 2011).

To provide more detail, eating attitudes are advised to be positive, relaxed, and flexible (Satter, 2007a). An individual's attitudes are fostered by being sensitive to and aware of what is eaten along with the hedonic rewards from eating (Satter, 2007a). Eating competence comes from being intrinsically motivated to eat a variety of food, including nutritious foods, where enjoyment and food preference is learned (Satter, 2007a). Simply put, people do not like to be told what to eat. Being told what to eat attracts resistance and criticism (Satter, 2007a). Instead, food acceptance and behaviors should include the following: (1) being calm in the presence of food; (2) being comfortable with preferred food; (3) be able to pick and choose from available food; (4) settling for less appealing food when necessary; and (5) being curious about novel foods, experimenting with novel foods, and feeling comfortable eating novel foods as a part of the food repertoire (Satter, 2007a).

Regulation of food intake parallels physiological needs where energy levels are balanced by being attuned to the sensation of hunger, appetite, and satiety (Satter, 2007a). When practicing eating competence, there is an emphasis on internally regulating eating (Satter, 2007a). However, Satter's eating competence recognizes genetics, lifestyle, age, activity level, and the internal ability to regulate food intake define the parameters of body weight (Satter, 2007a). When unstable body weight is identified, it is corrected with appropriate limitations and distorted perspectives are dismissed (Satter, 2007a). Sustainable activity is an important part of keeping an individual's body weight stable (Satter, 2007a). Some parameters to follow for a stable body weight are these: (1) responding to the intrenal regulators of hunger, appetite, and fullness; (2) having the abilty to stop when satisfied; (3) being comfortable with the amount eaten and the experience of satiety; and (4) the acceptance of body weight that evolves from internal regulated eating (Satter, 2007a).

Restoring and maintaining a stable body weight requires strategic meal-planning principles with a strong permission to eat adequate amounts at scheduled times (Satter, 2007a). To eat adequate amounts in scheduled intervals, the individual needs to have the necessary skills and resources (Satter, 2007a). One skill is to pay attention to the food and yourself during eating (Satter, 2007a). By being aware of the food and your needs, it may be possible to postpone eating and tolerate moderate hunger (Satter, 2007a). A second skill is to be confident there will be enough food to satisfy hunger at meal time (Satter, 2007a). Meals can be rewarding by choosing foods to satisfy nutritional needs and preferred foods where the proper amount of salt, sugar, and/or fat are added (Satter, 2007a). A final skill is to make enough time to eat. It is important to suspend other activities and make time for eating (Satter, 2007a).

Taking the perspective that eating is based on food-related behaviors and attitudes is the foundation for the Satter Eating Competence Model (ecSatter) (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007). Described as an interpersonal approach to eating and food-related behaviors (Krall & Lohse, 2011), ecSatter is a model that has been developing over 40 years where eaters are confident, comfortable, and flexible with eating (Satter, 2007a). Individuals who are eating competently are second nature to the task of being able to get a satisfying amount of food that is enjoyable to eat and nutritious (Satter, 2007a). Unlike the *Dietary Guidelines* or *MyPyramid*, food restrictions are not a part of the ecSatter model (Satter, 2007b).

To be more global and diverse, the ecSatter model has been tested to verify the model is valid with a low-income population, specifically females. In a study with low-income females, the objective was to understand the modifiable determinents of food choices in a low-income population as well as the construct validity of the instrument (Krall & Lohse, 2011). The ecSatter

Inventory (ecSI) was tested as a potential instrument for a low-income audience (Krall & Lohse, 2011). During cognitive testing, it was found that four of the 16 items of the ecSI were misinterpreted due to clarity and wording (Krall & Lohse, 2011). These four items were reworded, retested, and combined with the 12 other unaltered items to produce the ecSI for Low-Income (ecSI/LI) (Krall & Lohse, 2011). Results for the instrument's construct validity indicate ecSI/LI is a valid tool to measure and assess the eating competence for low-income females (Krall & Lohse, 2011).

Satiation and Satiety

To manage an individual's food consumption a clear understanding of an individual's appetite, satiety, and food intake will be necessary to develop effective interventions (Crowley, 2008). Raynor and Epstein (2000) indicate obesity and binge eating are a consequence of impairment in satiation, rather than satiety (as cited in, Kissileff, 1995 and Spiegel, Shrager & Stellar, 1989). Raynor and Epstein (2000) continued by establishing that satiation is the process that regulates termination of an eating bout, whereas satiety generally represents a period of reserve of eating (as cited in, Blundell 1979 and Blundel & Rogers 1991). To gain eating competence, the abilty to end an eating episode (satiation) and to set aside eating (satiety) are necessary to reduce obesity trends.

The objective of the study by Raynor and Epstein was to see if an individual's sensory factors (taste and flavors) had an effect on an individual's satiation. What was found is that taste and flavor ranked higher in the stopping of eating then did macronutrients or energy needs (Raynor & Epstein, 2000). Satter (2007a) shared a similar perspective, indicating that adequate amounts of preferred foods and nutrtious foods should be planned and enjoyment of the food should be encouraged.

Extending the discussion on eating competence, Glanz et al. (1998) investigated variables that had an impact on food intake. In an effort to understand food consumption, Glanz et al. (1998) examined food choices based on taste, nutrition, cost, convenience, and weight control. Conclusions from the study indicated individuals gravitated towards food that they like and give them pleasure (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998).

In a study with preschoolers, Johnson (2000) focused on food choices based on taste, nutrition, cost, convenience, and weight control. The study indicated a child's food consumption was regulated by parental eating habits (Johnson, 2000). Johnson (2000) also found that cues can be provided to help children focus on internal signals, such as recognizing when they have had enough, and improve their ability to self-regulate food intake (Johnson, 2000). Indicating, if parents are able to model proper food consumption skills and have the self-efficacy to maintain the intended behavior there is the potential for the child to display the same behavior. By starting with adults and amending food consumption, the appropriate food intake regulation will reach the upcoming generation.

Gaining eating competence through parents whom model proper food consumption skills may be a cumbersome task. In a study by (Hovland, McLeod, Duffrin, Johanson, & Berryman, 2010), the proper nutrient level and food group recommendations indicated by *My Pyramid* for kids are not being met. Students are seeking foods that are filled with sugar and fats, thus replacing healthy foods that are identified in the main food groups (Hovland, McLeod, Duffrin, Johanson, & Berryman, 2010). The irregular dietary patterns children are demonstrating may have an impact on disease risk later in life. When an adult or a child models eating patterns characterized by high intakes of fruits, vegetables, legumes, fish, poultry, whole grains, and low fat dairy there is a reduced risk of cancer (as cited in Slattery, Bouher, Caan, Potter, & Ma,

1998), coronary heart disease (as cited in Fraser, Sabate, Beeson, & Strahan, 1992; Hu, et al., 2000; Jacobs & Steffen, 2003; Kerver, Yang, Bianchi, & Song, 2003; Liu, et al., 1999), C-reactive proteins (as cited in Lopez-Garcia, et al., 2004; Schulze, et al., 2005), and mortality rates (Barkoukis, 2007). Self-management skills by children and adults as well as the functional knowledge of proper food consumption will amend the consumption of food that leads to disease risk.

The discussion around food consumption has revolved around sensory factors, parental eating habits, and nutritional value. However, the intake of food from a variety of food groups is also impacted by socio-economic, demographic, and lifestyle variables (Barkoukis, 2007). Demographics involve the gender, race, income, and educational levels of a population. Glanz et al. (1998) refed to studies by Kristal et al. (1995) and Glanz et al. (1994) indicating demographics had a varying impact on an individual's taste, nutrition, cost, convenience, and weight control. Concluding, the food choices of individuals vary by age, gender, income, and ethnicity (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). An individual's lifestyle around healthy behaviors and food choices is a strong predictor of the choices an individual makes regarding the importance of nutrition and weight control (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). Indicating the environment of an adult or a child has a significant impact on an individual gaining eating competence and making healthy food choices.

Health Promotion and Nutrition Education

The recent attention to Michelle Obama's campaign to combat obesity in our country addresses the need for a study to learn more about an individual's self-efficacy to regulate eating habits. According to Brug, Oenema, and Cambell (2003), the first step to health promotion planning is to identify a health problem that is serious enough to justify spending time, money

and other resources to develop and implement an intervention. According to *Solving the Problem of Childhood Obesity within a Generation* (2010), $150 billion per year is spent on obesity-related medical conditions.

In the second step to health promotion planning, identifying the specific and environmental risk factors for regulating eating habits should be identified, as should the groups who are exposed to these risk factors (Brug, Oenema, & Campbell, 2003). The risk of obesity can be seen across the country, where obesity rates for a body mass index (BMI) of greater than or equal to 30.9 for individuals who are 20 years or older (U.S. Obesity Trends, 2009) are increasing. A BMI of 30 or greater is defined as obesity (U.S. Obesity Trends, 2009).

The third step is to find out why individuals have a challenging time regulating their eating habits (Brug, Oenema, & Campbell, 2003). An analysis of the individual's psychosocial determinants will indicate the individual's intentions or motivations, a weighing of pros and cons (attitudes), social influences, perceived behavioral control, and personal norms (Brug, Oenema, & Campbell, 2003). Intent to change the behavior is demonstrating a commitment to make a change. However, the action of the behavioral change has not yet been activated. Acting on an intention depends on the individual's attitude, social influences, personal norms, and perceived behavioral control.

Take an individual that has a positive attitude towards eating healthier. The individual wants to eat a well-balanced diet that has a variety of different foods from all of the food groups. However, the individual is tempted by a variety of unhealthy choices at work and at home (social influences). In addition, the individual is accustomed to eating foods more appealing to the taste buds than to the waistline (personal norms) and is limited on the control needed to regulate eating habits to develop self-efficacy.

The process of making the best choices begins with establishing the power to choose. Awareness, goals, values, information, and life skills are prerequisites to making an empowering choice (Anderson, 1986). To manage oneself, the individual evaluates past and current choices, reflects, and then makes the necessary adjustments (Anderson, 1986; A Guidance Document for Achieving the New York State Standards In Health Education, 2005). The process involves decision-making skills, communication skills, planning and goal setting skills, stress management skills, and advocacy skills (Anderson, 1986; A Guidance Document for Achieving the New York State Standards In Health Education, 2005). Each of these sub skills interacts and complements one another to establish an environment that promotes wellness and empowers the individual (Anderson, 1986). As skills are developed and the process unfolds, self-efficacy becomes second nature due to practice, reflection, and reinforcement (Anderson, 1986). As indicated by Brug, Oenema, and Campbell (2003) it is necessary to be cognizant of behavioral determinants when developing a nutrition education program.

Using the Internet to Deliver Interventions

As a nation with an obesity epidemic and an interest in the Internet (Computer and Internet Use, 2009), researching a method to promote eating competency with interactive technology, theoretically, seems to be a good fit. As the Internet becomes a more accepted source for communication, workplaces are using the Internet to conduct health promotion interventions (Cook, Billings, Hersch, Back, & Hendrickson, 2007). The information received via the Internet influences how an individual manages her/his overall health and responds to prescribed treatments (Harris Interactive, 2001). In addition, past studies indicated that Web-based interventions were more effective than non-Web-based interventions and interventions with printed materials (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004; Cook, Billings,

Hersch, Back, & Hendrickson, 2007). Web-based interventions, once built, are more cost

effective since the intervention can be delivered to millions, reaching audience sizes unattainable

by the traditional workplace health promotion programs (Cook, Billings, Hersch, Back, &

Hendrickson, 2007).

Web-based Interventions and a Theoretical Framework

An article posted on the *New York Times* website indicates all the listings for health

related websites would fill an encyclopedia in the following categories: general interest, medical

research sites, patient sites, disease-specific sites, and web tool (Schwartz, 2008). This is

different from the estimated 17,000 to 45,000 health-related sites on the Internet Evers et al.

estimated in 2003. Regardless, the problem is many of the sites do not include the basics for

health behavior change and those sites that do address health behavior change need to be

improved (Evers, Prochaska, Prochaska, Driskell, Cummins, & Velicer, 2003). Health

communication from credible sources, having a message strategy, determining the setting or

channels for delivery (Kreuter & Wray, 2003), and addressing important differences between

groups (Rimer & Kreuter, 2006) are fundamental components of a website. A recommendation

of the United States Department of Health and Human Services (2007) is for the website to

disclose the quality of information on health-related sites.

Studies to Support the Theoretical Framework

To ensure a health-related website intervention has quality information the intervention

needs to be theory based. Bandura's social cognitive conceptual model (observational learning,

boosting of self-efficacy, behavioral capability, outcome expectations, and outcome

expectancies) has been the theoretical framework for several Web-based health intervention

studies (Bernhardt, 2001; Ornes & Ransdell, 2007; Cook, Billings, Hersch, Back, & Hendrickson, 2007; Oenema, Brug, & Lechner, 2001).

The importance of a sound theoretical framework is evident in a study by Ornes and Ransdell (2007). Focusing on a Web-based physical activity intervention for college-aged women, the author's employment of the social cognitive theory was to develop behavioral capability through self-efficacy, outcome expectation, and reinforcement. Behavioral capability is obtaining the knowledge and skill to perform a given behavior (Baranowski, Perry, & and Parcel, 2002). Self-efficacy is the confidence a participant has in performing a behavior and overcoming barriers to that behavior (Baranowski, Perry, & and Parcel, 2002). Outcome expectations are the outcomes the participant expected due to the behavior change and reinforcement. The outcomes could be positive or negative depending on the participant's response to a behavior that increases or decreases the likelihood of the behavior modification (Baranowski, Perry, & and Parcel, 2002).

A tailored message supported by a theoretical framework indicates the benefits of Bandura's social cognitive theory. In addition, a central tailoring variable is an individual's readiness to change (Rimer & Kreuter, 2006). The Bernhardt study (2001) was a randomized experiment focusing on using tailored messages and design in a Web-based skin cancer prevention intervention that depended on an informed theoretical framework for tailored messages through the outcome expectancy construct and the self-efficacy construct found in the social cognitive theory. What was found is the two constructs were instrumental in the development of applicable messages that are specific and relevant (Bernhardt, 2001). Participants in the experimental group that received a tailored web page were more likely to read the page and less likely to accept beliefs about tanning than the group that received the generic

page (Bernhardt, 2001). Indicating, the tailoring of messages on web pages may have relevance in prevention (Bernhardt, 2001).

In the areas of attitudes toward a healthful diet, dietary stage of change, and the nutrition/weight management segment on dietary self-efficacy, the research study indicated the Web-based program demonstrated statistical significance over the print materials program (Cook, Billings, Hersch, Back, & Hendrickson, 2007). Although the Web-based intervention was more appealing, there was no statistical difference in the outcome measures of physical activity and stress regardless if the intervention came from the Web-based program or printed material program (Cook, Billings, Hersch, Back, & Hendrickson, 2007). However, both the Web group and the printed material group demonstrated an improvement in health practices and attitudes. Since there was no control group, it was difficult to indicate if the improvements were attributed to social desirability and/or the Hawthorne Effect (Cook, Billings, Hersch, Back, & Hendrickson, 2007; McDermott & Sarvela, 1999). The study did indicate the workers preferred the Web-based program to the print material, indicating, a multimedia Web-based program can be an effective protocol to deliver health promotion materials to the workforce (Cook, Billings, Hersch, Back, & Hendrickson, 2007).

Relevant messages and design in a Web-based intervention have a significant impact on outcome (Bernhardt, 2001; Kukafka, Lussier, Eng, Patel, & Cimino, 2002), however minimal strategies are employed to further support behavioral outcomes. Healthy People 2020 is taking a direct role in providing a web-based document to obtain sustained behavioral changes. Healthy People 2020 plans to deliver information that is tailored to the needs of the individual (Phase I Report, 2010). A tailored message is an innovative method to target segmented audiences (Rimer & Kreuter, 2006). Content alone is not enough to foster behavioral change (Evers, Prochaska,

Prochaska, Driskell, Cummins, & Velicer, 2003). Along with content, there is a need for the participant to be motivated to initiate a behavioral change. When the tailored message is perceived to be personally relevant, the participant is more motivated to actively process the information (Rimer & Kreuter, 2006). During this time of active information processing, the participants consider the messages carefully, which triggers a compare and contrast response to other information and past experiences an individual has encountered (Rimer & Kreuter, 2006).

Tailored and Targeted Health Communication Strategies

A literature review indicated a progression in interventions from printed material interventions to Web-based interventions. Further development indicated a progression to tailored and targeted Web-based interventions. Even with the advancement in program delivery, there is no clear indication that tailored Web-based interventions are as effective in changing behaviors and as cost-effective as other methods (Brug, Oenema, & Campbell, 2003). Even though there is a wealth of literature on tailored and targeted Web-based interventions, due to the limited research that is reliable, the concepts will be explored, but not applied to this study.

A Web-based program can be more cost effective by including specific and relevant messages that are either targeted or tailored (Glasgow, et al., 2007). The Web-based versus non-Web-based study by Cook et. al. (2007) was designed to test the efficacy of a multimedia intervention compared to high-quality commercially available print materials on the same topics (but not necessarily the same content) as a control. Indicating a web-based intervention may need to have a combination of tailored and targeted messages to meet the needs of the target audience.

A combination of tailored and targeted messages is supported by the document *Importance of Using HIA in the US and for Healthy People 2020 Goals and Objectives*(2010). On page five, the document references choosing the best course of action when there are various

options. When addressing a web-based intervention there will be a potential need to use tailored and targeted health communication strategies. It could very well be that combining tailored and targeted health communication messages will have the most positive and fewest negative health effects (*Importance of Using HIA in the US and for Healthy People 2020 Goals and Objectives*, 2010). With Healthy People 2020's focus on a combination of procedures, methods, and tools a myriad of strategies could be employed to achieve an intervention outcome that has the most positive effects on an individual's health.

As the capabilities of the Internet advance, the information can be tailored to meet the needs of the target audience. Kreuter and Wray (2003) as well as Roberto, Krieger, and Beam (2009) indicated that tailored messages (messages specific to the individual) stimulated a greater cognitive message; however, a targeted message (messages specific to a group) designed for a global purpose can be just as effective. To understand the significance of tailored messages compared to a targeted message, participants in the Kreuter and Wray study were exposed to both tailored and targeted health communication messages. The targeted health communication messages in the Kreuter and Wray study were based on the trends of the literature and the tailored messages were based on relevance to promote the success of the participants. Concluding, tailored messages were a proven approach to enhancing message relevance, but not the only health communication strategy; and depending on the setting tailored messages may not be the preferred message (Kreuter & Wray, 2003; Roberto, Krieger, & Beam, 2009). Even though targeted messages are significant in building self-efficacy to amend food consumption (Kreuter & Wray, 2003), for the reason stated above this study will reserve the use of target and tailored messages for future studies.

Constructs of the Social Cognitive Theory in Health Promotion Interventions

Health promotion has endured several paradigm shifts. To establish a healthy behavioral change in individuals, the discipline of health promotion has progressed from alarming people about morbidity and mortality rates, to rewarding people for healthy changes, to organizing dependable social support (Bandura, 1998). The purpose of the social cognitive theory (SCT) in health promotion is to help people stay healthy through good self-management of health habits (Bandura, 1998).

SCT has been tried and tested in several areas of health promotion. Two specific areas where the SCT has been evident are in nutrition interventions as well as physical activity interventions (Gaines & Turner, 2009; Hortz & Petosa, 2008). The theory is also progressing to more sensitive health promotion areas such as breast cancer patients and identifying what barriers prevent women from being physically active after being diagnosed (Rogers, Matevey, Hopkins-Price, Shah, Dunnington, & Courneya, 2004). The broad perspective of the SCT enables the theory to be a manageable theoretical framework for establishing a behavioral change.

In Glanz, Rimer, and Lewis (2002), Baranowski, Perry, and Parcel indicated 11 major constructs in the SCT. These constructs are the cognitive forces to guide a behavioral change (Compeau & Higgins, 1995). Of the 11 constructs, self-efficacy was the highlighted construct. Since self-efficacy is a judgment of the participant's capability to perform an action (Bandura, 2006) the other 10 constructs will complement each other to promote self-efficacy (Compeau & Higgins, 1995). The 10 other constructs are environment, situation, behavioral capabilities, observational learning, triadic causation, outcome expectancies and expectations, emotional

arousal, self-regulation, and incentives/rewards (Bandura, 1999; Baranowski, Perry, and Parcel 2002).

Self-efficacy

Self-efficacy is an action attached to a behavior where the individual is ready to change an identified behavior through an enhancement of mastery experiences, vicarious experiences, social persuasion, and physical and emotional states (Bandura, 1999). The construct of self-efficacy is the pillar in which all other constructs from the social cognitive theory work in partnership with to manage human thought, actions, and motivation (Bandura, 2006). According to Baranowski, Perry, and Parcel (2002), "self-efficacy is the confidence a person feels about performing a particular activity, including confidence in overcoming the barriers to performing the behavior (p. 173)." Compeau and Higgins (1995) provided Bandura's definition of self-efficacy as

> "People's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (as cited in Bandura, 1986, p. 391).

A situation where self-efficacy is needed is when an individual may have the intention to start consuming five servings of fruits and vegetables a day into his/her diet or making the decision to start stretching before and after physical activity in an effort to prevent injury and increase flexibility. The difficulty of attaining the behavioral change to eating five servings a day or implementing a stretching routine is the magnitude needed for self-efficacy to occur (Compeau & Higgins, 1995). An individual's perception of the obstacles that will occur is referred to as self-efficacy strength (Compeau & Higgins, 1995). Whether or not the

environment is conducive to the change is the generalizability of self-efficacy (Compeau & Higgins, 1995). The example below will help to conceptualize these ideas.

Eating five serving of fruits and vegetables a day may be a minimal challenge for individuals who have the economical means to purchase an adequate amount of produce each week (self-efficacy strength). While other individuals who have lesser means to acquire produce may find consuming five serving of fruits and vegetables a day is a cumbersome task (generalizability of self-efficacy). However, as an individual's self-efficacy improves, the quest can be achieved (magnitude of self-efficacy). To increase an individual's self-efficacy in any behavioral change, small steps can lead to success (Baranowski, Perry, & Parcel 2002). The small specific steps will ensure success and build the individual's confidence. As the individual's confidence increases, there is an increased chance the individual will take action to make the behavior change.

The steps to success are different for each individual. For example, an individual who has a rich background in physical activity may only need a stretching routine to start the action of stretching before and after physical activity (self-efficacy strength). Another individual may be unfamiliar with the reasons for stretching before physical activity and the need to stretch after physical activity (self-efficacy strength). Even though each individual is taking action to develop self-efficacy, the activity to foster self-efficacy will be different.

To promote self-efficacy, an individual also needs to have a supportive environment and self-management behaviors. Self-management is an individual's ability to control actions that have a positive influence on her/his health and well-being. In 2010, a computer assisted diabetes self-management study was conducted to further understand the degree of self-efficacy needed to manage diabetes (King, et al., 2010). King et al. (2010) concluded that self-efficacy was needed

to promote self-management. In diabetes, where an individual's nutrition and physical activity self-management impact the status of the disease, self-efficacy is a predictor of the individuals frequency and duration of effort as well as the nutritional changes a person could make (Francis, Taylor, & Halderman, 2009 as cited in, AbuSabha & Achterberg, 1997). Indicating, self-efficacy provides the "push" to initiate an individual in action to make a positive behavioral change.

Triadic Causation, Environment, and Situation

There are several theories on how an individual acquires and sustains a behavioral change. Bandura (1999) indicated people are self-organizing, proactive, self-reflecting, and self-regulating, not just reactive beings shaped and guided by external events. Actions that people take are based on thought (Bandura, 1999). By placing a value on the thought, an individual is able to strategize and organize future actions (Bandura, 1999). Activities like forethought, intention, aspiration, proaction, creativity, self-appraisal and self-reflection, and their functional neural circuitry, have an impact on behavioral change (Bandura, 1999).

Triadic causation provides a setting for internal person factors, biological events, behavioral patterns, and environmental events to interact and influence one another bidirectionally (Bandura, 1999). These simultaneous interactions between characteristics of the individual, the behavior of the individual, and the environment are where the behavior takes place (Bandura, 1999; Baranowski, Perry, & and Parcel, 2002). If a change in behavior takes place in one dimension (environment), there is a change in the characteristics of the individual and the behavior of the individual (situation) (Bandura, 1999; Baranowski, Perry, & and Parcel, 2002). The same relationship holds true if the characteristics of the individual changes. When there is a change in the characteristics of the individual (situation), there will also be a change in the individual's behavior and the environment of the individual (environment) (Baranowski,

Perry, & and Parcel, 2002). Coming to a full circle with the concept of triadic causation, if there

is a change in the individual's behavior a change will also take place in the individual's

characteristics and the environment (Baranowski, Perry, & and Parcel, 2002). Figure 2

demonstrates the interaction of the three dimensions.
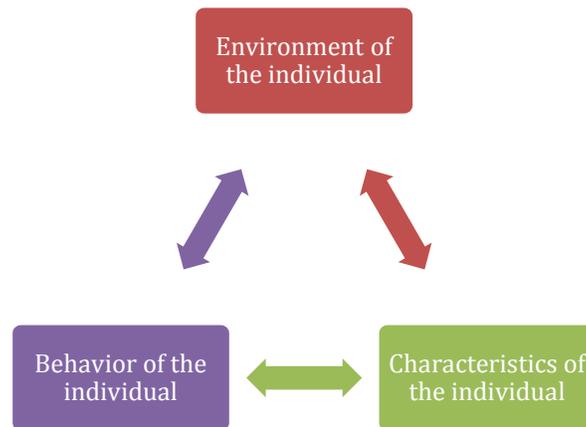
Figure 2. SCT triadic causation

When a change in one of the three dimensions occurs, the situation has also changed

(Baranowski, Perry, & and Parcel, 2002). Now the individual needs to assess and analyze the

new surroundings to build on the positive change.

Behavioral Capability

To become better at a skill, the words practice, practice, and practice are a familiar

phrase. The construct behavioral capability justifies this concept. Behavioral capability is having

the knowledge and skill to execute a conscious behavior (Baranowski, Perry, & and Parcel,

2002).

Langlois, Petosa, and Hallam (1999) conducted a study with sixth-graders to analyze why effective smoking prevention programs work. A component of the study was to implement the behavioral capability construct. In the study, images were shown to students in which a distinction needed to be made to resist the positive images of smoking (Langlois, Petosa, & Hallam, 1999). For each image shown, the student was assigned the task to identify, evaluate the truthfulness, and then reject favorable images of smoking presented through media and adult modeling (Langlois, Petosa, & Hallam, 1999). Even though the strategies employed to increase the knowledge and skill of student were insignificant (Langlois, Petosa, & Hallam, 1999), the activity provided an experience that may have a significant impact in a future situation.

A study by Hammer, Degerfeldt, and Denison (2007) used the SCT as a theoretical framework to monitor exercise in patients who were diagnosed and prescribed therapy for back pain. The construct behavioral capability was a construct employed in the study. Behavioral capability played a part in indicating if the individual was able to repeat the exercises prescribed and was able to correct their posture (Hammer, Degerfeldt, & Denison, 2007). At the conclusion of the study, participants indicated a decrease in pain and an increase in mobility (Hammer, Degerfeldt, & Denison, 2007).

Practicing a conscious behavior provides a platform to build self-efficacy. As an individual's strength, magnitude, and generalization of self-efficacy are fostered; the participant can reevaluate their progress and prepare for the next level of skill adaption. In addition, the exposure to knowledge that can promote the engagement of skill development is essential in the construct of behavioral capability (Rogers, et al., 2004).

Observational Learning

When an individual sees something interesting, there is the motivation to emulate the behavior. An example is when parents model good eating habits for their children. The action of watching a behavior and then acquiring the traits to initiate the observed behavior is observational learning (Baranowski, Perry, & and Parcel, 2002).

Observational learning was the fundamental construct in a study to recognize if video messages were significant in a mobile phone intervention for smoking cessation. In the study, observational learning was viewed as a means to develop self-efficacy through video messages produced from role models who had previously quit smoking (Whittaker, et al., 2011). Even though the study encountered difficulties with participant attrition and power to the study, participants were pleased to have the video messages as an intervention strategy (Whittaker, et al., 2011). Indicating, observational learning and the social cognitive theory are an appropriate framework for web-based interventions (Whittaker, et al., 2011).

In nurse education programs, observational learning is significant to teaching a nurse proficient skills. When a nurse observes and then models a prestigious nurse the student nurse is able to see beneficial skills in action and then employ the same skills into his/her repertoire of skills (Bahn, 2001). As nurses learn from modeling other colleagues, Lewis (2009) indicated that learning can take place through an avatar. An avatar is a model of the participant and when the avatar is successful so too is the participant that created the avatar (Lewis, 2009). Since the avatar is the ideal-self of the participant there is a heightened ability to learn (Lewis, 2009).

Encouragement from others is an additional means to promote observational learning. In a study investigating exercise for women with breast cancer, encouragement was identified as a form of observational learning (Rogers, et al., 2004). Observational learning is a distinct

construct in the effort to produce self-efficacy. Learning through observation provides an

environment and situation for the participant to gain knowledge and skill through a positive

experience.

Emotional Coping Responses/Emotional Arousal

Emotional arousal is another constitute that affects self-efficacy (Bandura, 1977). If an

individual has a heightened state of arousal the chances of a performances being debilitated are

increased (Bandura, 1977). Thoughts provoked by anticipated fear can cause anxiety beyond the

actual fear that is to be experienced (Bandura, 1977). However, anxiety arousal can be reduced

with positive experiences in modeling and mastery experiences (Bandura, 1977).

When an individual is able to overcome arousal there is also an increase in coping skills

(Bandura, 1977). It is the threatening situations that engage the coping skills, thus providing an

experience to develop a skill (Bandura, 1977). By being able to control the adverse conditions of

the environment, the individual is also able to control how the environment is perceived

(Bandura, 1977).

Self-Regulation

Self-regulation is an interaction between self-structures and regulatory functions

(Bandura, 1999). These regulatory functions are observing one's behavior, referential

comparison, validation of activities, and personal efficacy (Bandura, 1998). What happens is the

structure of a self-system and the regulatory process work together in human functioning

(Bandura, 1999). Components of self-regulation include self-monitoring, self-blaming

judgments, and defensive self-reactions (Zimmerman, 2000). To be functional, self-regulatory

mechanisms need to be activated to operate (Bandura, 1999). An individual's perception of a

situation is based on the ability to regulate an action while considering his/her sense of self

(Zimmerman, 2000). A humans' ability to self-regulate provides the conditions to adapt and adjust when the environment or surroundings change (Zimmerman, 2000). When an individual self-regulates thoughts, feelings, and actions there is more control by the individual and the outcome is goals that are clearer and realistic (Schunk & Zimmerman, 1994).

Evidence of strong goal setting and positive outcomes is documented in a study where Asian families reserved the evening to study and master essential learning methods through repetition (Caplan et al.,1992 as cited in, Schunk & Zimmerman, 1994). A second study looks at the underachiever who is more impulsive and has lower goals (Borkowski & Thorpe, 1994 as cited in Schunk &Zimmerman, 1994). The outcome of the study indicated underachievers are more self-critical and are less self-efficacious about their performance and there is the potential to give up easier (Borkowski & Thorpe, 1994 as cited in Schunk &Zimmerman, 1994).

Outcome Expectations/Expectancies

"In social cognitive theory, "reinforcement" is a form of incentive motivation operating through outcome expectations rather than an automatic strengthener of responses" (Bandura, 1999, p. 36). There are three major forms of outcome expectations that contribute to health behavior: physical, social, and self-evaluation (Bandura, 1998). For each of the forms, when there is a positive outcome, there is an incentive and when the outcome is negative, there is a disincentive (Bandura, 1998). Outcome expectancies are referred to by Bandura as incentives or values placed on an outcome (Bandura, 1977; Bandura, 1986 as cited in, Baranowski, Perry, & and Parcel, 2002).

In the physical form, positive outcomes are pleasant sensory experiences and negative outcomes are pain and physical discomfort (Bandura, 1998). Perceived benefits are an example of a positive physical outcome while perceived susceptibility and severity are negative physical

outcomes (Bandura, 1998). Along with the physical form of outcome expectancies, the positive and negative social sanctions have an impact on behavior (Bandura, 1998). Behavior that fulfills social norms gains positive social reactions and behavior that violates social norms brings social criticism (Bandura, 1998). Positive self-evaluation outcomes are displayed in the form of self-satisfaction and self-worth, which can be an influential regulator of human behavior (Bandura, 1998).

Reinforcement/Rewards

When an individual is working towards a behavioral change, appropriate reinforcement and rewards enable the positive behavioral change to take place. Reinforcement is a reaction or response to an individual's behavior that increases or decreases the probability of the same behavior occurring more and more (Baranowski, Perry, & and Parcel, 2002; Rogers, et al., 2004).

Reinforcement can be established through social support as well as other means such as an activity log that records outcomes, self-talk, praise, and purchases (Grim & Pazmino-Cevallos, 2008; Rogers, Matevey, Hopkins-Price, Shah, Dunnington, & Courneya, 2004). Reinforcement also has the ability to change social norms, particularly in an intensive care unit for a hospital. Reinforcement came in an interpersonal delivery to infectious control professionals by providing support through the social environment (Curry & Cole, 2001). When protocol was followed compliance was recognized with an "on the spot" complement to reinforce the intended behavior (Curry & Cole, 2001). By establishing reinforcement patterns, an individual will attain the self-efficacy actions needed to initiate a behavioral change.

Constructs of the SCT for this Study

It is the intent of this study to include as many constructs as possible. However, since the SCT covers a wide range of issues (Bandura 1986) there will be a focus on four constructs: self-efficacy, behavioral capabilities, observational learning, and reinforcement. Other constructs of the SCT will be interwoven and identified in the study, but will not be developed to the extent of self-efficacy, observational learning, behavioral capabilities, and reinforcement.

Dosage for a Web-based Intervention

Dosage for each intervention is based on volume. In 2007, Cook et al. conducted a field test of a Web-based workplace health promotion program. The Web-based workplace health promotion program focused on improving dietary practices, reducing stress, and increasing physical activity (Cook, Billings, Hersch, Back, & Hendrickson, 2007). Findings from the dosage analysis concerning the improvement of dietary practices indicated (1) effects of the Web program were real and not a result of social desirability or other nonprogram effects and (2) there was a positive linear function on the number of times a participant accessed the intervention (Cook, Billings, Hersch, Back, & Hendrickson, 2007). Meaning, the more a participant was exposed to the intervention, the more there were improvements (Cook, Billings, Hersch, Back, & Hendrickson, 2007).

Multiple exposure to a Web-based intervention is echoed in the study Bernhardt (2001) conducted on Web-based skin cancer prevention. One of the limitations of the study is there was only a single exposure to a mostly text-based web page (Bernhardt, 2001). If the tailored message on the web page had been exposed more than once, effects on the study may have been stronger (Bernhardt, 2001).

In a meta-anlaysis, Wantland et. al. (2004) reported the time spent/session/person ranged from 4.5 to 45 minutes. "Session logons/person/week ranged from 2.6 logons/person over 32 weeks to 1008 logons/person over 36 weeks" (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004, para. 4). The outcome of the meta-analysis indicates Web-based interventions that focused on specified knowledge and/or behavior change were effective (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004).

In a Web-based alcohol screening and brief intervention study, Kypri, Langley, Saunders, Cashell-Smith, and Herbison (2008) conducted a randomized controlled study with three groups. Group one received an information pamphlet only; group two received a Web-based single dose of the intervention; and group three received a Web-based multiple dose of the intervention (Kypri, Langley, Saunders, Cashell-Smith, & Herbison, 2008). The intervention for group two and group three was assessment questions and personalized feedback (Kypri, Langley, Saunders, Cashell-Smith, & Herbison, 2008). Since group three received a multiple dose, participants in this group repeated the assessment questions and the personalized feedback at 6-months and 12-months (Kypri, Langley, Saunders, Cashell-Smith, & Herbison, 2008). Results indicated the single intervention reduced hazardous drinking for a 12 month period and additional sessions did not enhance the effect (Kypri, Langley, Saunders, Cashell-Smith, & Herbison, 2008).

A 6-week randomized controlled trial measured the delivery of an intervention for depression through the Internet, with the use of five modules to present content (Christensen, Griffiths, & Jorm, 2004). In a sequential protocol, each week , one of five different modules was made available to the participant over six-weeks (Christensen, Griffiths, & Jorm, 2004). The

outcome of the study indicated the two interventions delivered by the Internet were effective in reducing the symptoms of depression (Christensen, Griffiths, & Jorm, 2004).

Participant Attrition during a Web-based Intervention

For a randomized control study, participants are assigned to a group to help make the comparison possible (Dignan, 1995). In any study there is the possibility participants will be lost, thus making the groups unequal and less alike which creates a counter to the purposes of the study (Birnbaum, 2004; Dignan, 1995). Web-based interventions are no different. In fact, web-based interventions have a significantly high rate of attrition ranging from 77.5% to 99.5% Eysenbach, 2005), indicating; only 0.5% to 22.5% of the initial sample population completes the intervention. Eysenbach (2005) coined this phenomenon the "law of attrition" (Eysenbach, 2005). Eyesenbach (2005) continued to indicate, high dropout rates are expected and take place (Eysenbach, 2005) so researchers should not get discouraged and still analyze, evaluate, and publish their results. The reason for the high attrition rates is individuals lose interest and stop using the application (Eysenbach, 2005; Stevens, et al., 2008).

One method to minimize dropout rates is to employ a strategy called the "high hurdle" technique of Reips (2000). The strategy is to get those who would drop out of the study to do so before the randomized groups are organized (Birnbaum, 2004; Frick, Bächtiger, & Reips, 2001). To execute the strategy, the primary researcher will ask for personal information early and will include a web page that downloads slowly (Birnbaum, 2004). Individuals who are impatient or resistant will dropout leaving cooperative particiapnts behind (Birnbaum, 2004).

A second strategy is to announce an incentive at the beginning of the study (Frick, Bächtiger, & Reips, 2001). This strategy involves letting the participants know that those who finish the study will be eligible to receive the designated prize (Frick, Bächtiger, & Reips,

2001). A method of this nature, succesful or not, has not been resrearched to examine if prizes keep participants from dropping out (Frick, Bächtiger, & Reips, 2001).

Attrition Rates in Past Studies

Even without the "high hurdle" technique or being enticed by prizes, there are studies that indicate attrition rates can be low. Cook et al. (2007) conducted a field test of a Web-based health promotion program. In a three-month study, the attrition rate was encouraging. Out of 419 participants, 15% of the Web-based group withdrew from the study and 13% of the print group withdrew from the study (Cook, Billings, Hersch, Back, & Hendrickson, 2007).

A four-week study in 2001 focusing on the use of tailored messages in a Web-based skin cancer prevention program reported 110 participants agreed to be a part of the study (Bernhardt, 2001). Of the 110 particiants, 102 (93%) completed the pretest and 84 (82%)completed the posttest (Bernhardt, 2001). Indicating, 18% of the particiapnts withdrew from the study.

A meta-analysis conducted by Wantland et.al. (2004), reported attrition rates at 21% when looking at the effectivness of Web-based vs. non-Web-based interventions of behavioral change outcomes. Aggregation of the participant data indicated there were a total of 11,754 participants (5,841 women and 5,729 men) (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004). The meta-analysis reported the range in duration of the studies was 3 weeks to 78 weeks (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004).

In 2004, Christensen, Griffiths, and Jorm conducted a 6-week randomized control trial to analyze the outcome of an intervention for depression using the Internet. Of the 525 participants that returned an informed consent form, 414 participants completed the intervention (Christensen, Griffiths, & Jorm, 2004), indicating a 21% attrition rate.

Keeping the Intervention Interesting

Engagement and retention of participants is a significant factor in keeping the participants interested. Even though the material on a website is useful, delivering behavioral change programs has limited engagement (Leslie, Marshall, Owen, & Bauman, 2005). To keep participants actively involved and interested in the site, there needs to be careful planning, design, and social support (Stevens, et al., 2008). Various prompts like phone calls and e-mails seem to be a strong cue to action and maintaining participant interest (Stevens, et al., 2008). Reviews also indicated awareness, knowledge, building health skills, and developing health literacy will maintain a participant's interest and commitment to a program (Stevens, et al., 2008).

A well-designed intervention starts with a steering committee. The overall objective of the team is to think globally about the intervention and provide scientific and conceptual guidance (Stevens, et al., 2008). For this study, the steering committee was the doctoral student's dissertation committee. The dissertation committee was be involved with the formative evaluation of the study, but the doctoral candidate managed the day-to-day development of the project (Stevens, et al., 2008).

To make sure the goals of the study are met, the chair of the committee had the role of the content and theory expert. The chair of the committee guided the doctoral candidate to a more detailed level ensuring objectives were met and aligned with the theoretical framework (Stevens, et al., 2008).

Providing the vision to the web-based intervention is the interface design specialist. The design specialist's ability to establish user functionality guidelines, be a consultant, and provide their professional programming knowledge is a necessity to the success of the web-based

intervention (Stevens, et al., 2008). Having the ability to transfer a concept into a web design takes collaboration on a consistent basis. A web designer that has a clear perspective of the researcher's perspectives, will make the site efficient and effective. For the study at hand, the doctoral candidate was in contact with the web designer several times a day verifying concepts and "clicks" to ensure the design of the site was valid and credible (Stevens, et al., 2008).

Confidentiality During a Web-based Intervention

In traditional studies, consent is provided with a written signature on a consent form agreeing to participate in the study. For web-based interventions, written and electronic consent forms are applicable. Depending on the inception of the study, participants may be asked to complete a written consent form or an electronic consent form. A written form of consent was requested in the web-based care management study for patients with poorly controlled diabetes (McMahon, et al., 2005).

As technology continues to advance methods have evolved that indicate a participant has agreed to partake in the study. These online consent forms are designed to obtain informed consent before enrolling in a study (Swartz, Noell, & Ary, 2006). One method is to reply with the words "I consent" (Whittaker, et al., 2011). The "I consent" statement was used in a study where participants received a video message on their mobile phone to aid in a smoking cessation intervention. A study focused on the web-based tailored nutrition education sent a letter to potential participants and a follow-up e-mail. If the participant replied to the e-mail, this indicated a willingness to participate in the study (Oenema, Brug, & Lechner, 2001).

Maintaining confidentiality in a study is necessary to ensure the protection of the participant. For Web-based studies, there are various forms of consent. The setting of the study

and expectations of the internal review board will be factors in the method employed to gain informed consent.

Summary

Across our nation, we are faced with an obesity epidemic. The literature indicates that social and physical factors as well as environmental factors play a significant role in obesity trends. Theoretical frameworks such as Bandura's social cognitive theory indicate children from their parents learn obesity patterns. The problem is the cycle continues to be passed along from generation to generation and the solution is to use an interactive strategy such as a Web-based platform delivered via the Internet to modify behaviors around eating competence.

Since the Internet has become a significant tool to provide information to individuals at a local, state, national, and global level, it would serve as a valuable resource and strategy to enable a behavioral change. A Web-based intervention will employ a combination of activities and messages to influence a behavioral change. The challenge is to execute an intervention based on an individual's behavioral intent and establish a behavioral change by incorporating self-efficacy skills. As an individual develops the skills to sustain and gain eating competence, the pattern and number of obese individuals in our nation will potentially decline.

The next step in this study is to develop an intervention that will gain eating competence through interactive websites that are based on a theoretical framework. The websites will be designed to increase an individual's self-efficacy skills to gain eating competence and add to the literature the value of web-based intervention that have a positive health effect on the individual.

CHAPTER 3

METHODS

Overview

In the United States, an annual estimate of medical expenditures attributed to obesity is estimated at $75 billion (Finkelstein, Fiebelkorn, & Wang, 2004). Being overweight or obese is a result of behavioral, environmental, and genetic factors (Culos-Reed, Doyle-Baker, Paskevich, Devonish, & Reimer, 2007). One strategy to manage food consumption is to employ the Satter Eating Competence Model (ecSatter) (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007). Eating competence intertwines four components: (1) attitudes about eating and the enjoyment of food; (2) accepting new food to add variety to your diet; (3) being able to eat the right amount of food; and (4) being able to manage food through proper planning, storing, preparing, and offering (Krall & Lohse, 2011). Complementing the ecSatter will be the constructs from the SCT. The purpose of the social cognitive theory (SCT) in health promotion is to help people stay healthy through good self-management of health habits (Bandura, 1998).

As a nation with an obesity epidemic and an interest in the Internet (Computer and Internet Use, 2009), researching a method to increase eating competence with interactive technology, theoretically, seems to be a good fit. As the Internet becomes a more accepted source for communication, workplaces are using the Internet to conduct health promotion interventions (Cook, Billings, Hersch, Back, & Hendrickson, 2007). The information received via the Internet influences how an individual manages her/his overall health and responds to prescribed treatments (Harris Interactive, 2001).

To conceptualize an individual's perspective of his/her eating competence, an instrumental case study with semi-structured interview questions provided an outlook on attrition

rates and the interaction of SCT constructs in a Web-portal. Collecting qualitative data provided a better understanding of the phenomenon. (Neutens & Rubinson, 2002). Qualitative data provided ground zero insight to a complex issue that was further understood (Creswell, 2007).

Since the focus of the research was on the impact of a Web-portal to make a sustained behavioral change, the format of a semi-structured interview provided the opportunity to analyze the process (Cohen & Crabtree, 2006). To ensure reliable and comparable qualitative data was collected, the researcher produced three interview guides that had clear directions and consisted of open ended questions (Cohen & Crabtree, 2006). Since the interview was semi-structured, the interviewer obtained the participants' perspectives on the process involved in navigating the Web-portal, which will aid in the development of an improved web-portal (Neutens & Rubinson, 2002).The drive of the research was to enable the individual with the skills to gain eating competence based on the constructs of the SCT.

Purpose for the Study

Research indicates Web-based interventions were significant in changing an individual's behavior or in achieving specified knowledge (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004). However, high attrition rates are associated with a Web-based study (Eysenbach, 2005). The purpose of this study was to analyze the qualitative aspects needed for a sustained behavioral change utilizing a Web-based intervention. The study exposes the human part of the phenomenon and focuses on attrition rates to better understand compliance when employing a web-portal (Jacob & Furgerson, 2012) (Creswell, 2007).

This study was theory-based to find out how future wellness programs can be designed employing constructs from the Social Cognitive Theory (SCT) and a Web-based platform. The findings of this study have become a foundation to conduct future research on methods that will

promote enjoyable and interactive activities to sustain a behavioral change using a Web-portal. By keeping the interventions grounded in theory and engaging, the expectation is attrition rates for Web-based interventions will decrease.

Content for the Web-portal focused on four areas of eating competence and was based on the ecSatter Model. Through semi-structured interviews, the study probed participants to determine the magnitude the ecSatter Model and the SCT had towards gaining eating competence, thus adding another layer of knowledge to the literature. Tailored information and Web-based activities to promote eating competence were placed in a four-section wheel. When activated, each section or channel of the wheel opened and provided a variety of content to promote growth. In 2003, Berg, Oenema, and Campbell indicated further research was needed to understand how tailoring impacts "multiple health related behaviors based on different sources and/or communicated through different channels" (p.1033S).

Qualitative Research Question

To handle high attrition rates and gain a deeper understanding on how constructs from the SCT influence eating competence, the overarching qualitative question becomes; what is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change? To support the overarching qualitative research question the following sub questions exist: (1) What activities/content in the Web-portal had the most impact? (2) What activities/content in the Web-portal had the most influence? (3) How do participants stay motivated when engaged in a Web-based eating competence program? (4) What type of content is needed in a Web-portal to produce a sustained behavioral change? (5) What makes the Web-portal easy to navigate? (6) What functionality needs to be included in a Web-portal to produce a

behavioral change? (7) How can the development of an eating competence Web-portal stay within the budget?

Research Design

With human subject approval from Southern Illinois University, Carbondale, individuals for this research were solicited from a township in Monroe County in the state of New York. According to the 2010 census, the township had 29,405 residents. The median income was $88,232 and the median house value was $183,100 (About Pittsford).

To conduct the study in the township, the researcher coordinated with the town supervisor to bring attention to the study. Since the town supervisor has an "open door" policy, a meeting was scheduled to brief the town supervisor about the study. During the meeting, questions the supervisor had about the study were answered.

The website for the township, community newsletters, and pamphlets in local businesses, as well as community events were a means to promote the study and solicit participants. The study required each participant to create an account. With the use of Wi-Fi, account set-up was scheduled to take place at community events and in the town library where computers were connected to a landline. Account set-up required the individual to create a username and password. To accommodate participants, the town library has a conference room that was scheduled be used to hold training sessions on how to set-up the account. Unfortunately, the library became unavailable and account set-up took place through the solicitation of participants. Figure 3 is an example of the account set-up page.
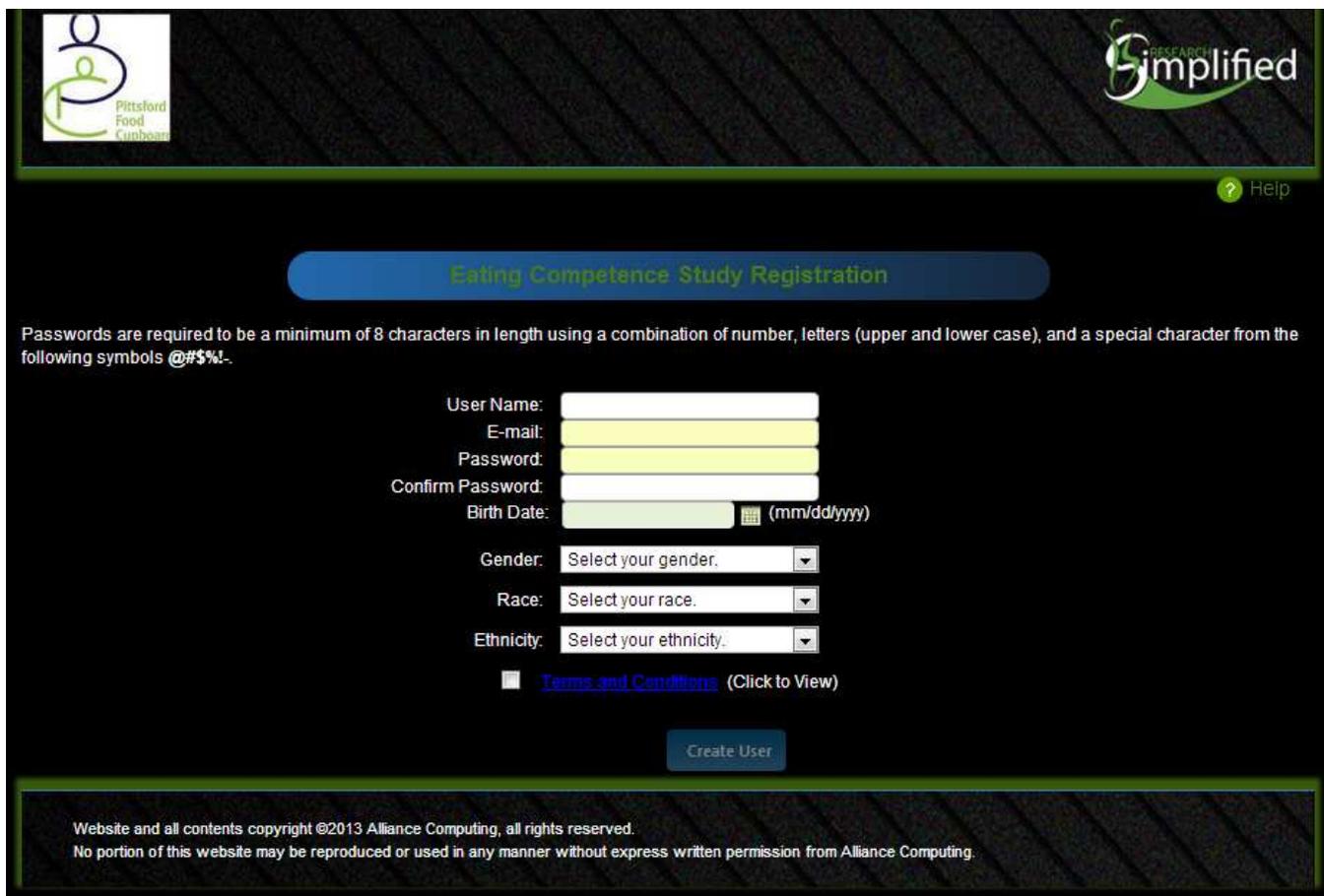
Figure 3. Account set-up page

When individual registered for the study, the "high hurdle" approach was employed. As stated in chapter 2, the "high hurdle" approach is a strategy to get those who would drop out of the study to do so before the randomized groups were organized (Birnbaum, 2004; Frick, Bächtiger, & Reips, 2001). To execute the strategy, the primary researcher asked for personal information early and included a web page that downloaded slowly (Birnbaum, 2004). Individuals who are impatient or resistant may have dropped out, leaving cooperative participants behind (Birnbaum, 2004).

In addition to the "high hurdle," incentives were announced at the beginning of the study. This strategy involved letting the participants know that those who finished the study would be

eligible to receive the designated prize (Frick, Bächtiger, & Reips, 2001). An example of an incentive was gift cards. A method of this nature, succesful or not, has not been researched to examine if prizes keep participants from dropping out (Frick, Bächtiger, & Reips, 2001). To be eligible for prizes, participants needed to log in four times within the first seven days and viewed at least three activities on the site during each log-in session.

   To be eligible for the study, participants met three criteria, (1) participants were18 years of age and a resident of the township. Eligibility was verified by a terms and conditions agreement; (2) participants had access to the Internet and a technological device (i.e., desktop computer, laptop computer, tablet, netbook, or phone) supporting an operating system where the individual interacted with the website; and (3) participants were also interested in gaining eating competence.

Analytics

   Google Analytics is a tracking system indicating the performance of a website. Google Analytics preserves the confidentiality of data so specific metrics can be compared to aggregate performance metrics (Google Analytics Feature, 2010). To measure overall and weekly attrition rates, Google Analytics is a resource that will compare an individual's visits including pages visited, and bounce rates in the form of charts and graphs for formative and summative feedback. Google Analytics has the capability to organize data for analysis that is relevant and credible. To verify if individuals are interacting with the skill set, Google Analytics was scheduled to indicate the length of time a participant was accessing an activity and the number of times the activity was downloaded. These methods of tracking verified that the self-reporting results from the participants were credible.

In addition to Google Analytics, a hybrid tracking process similar to Blackboard or Stat Centric monitored each individual's progress. Blackboard and Stat Centric include a visitor tracking system designed to monitor an individual's site navigation, visits, page views, and account creations (Blackboard, 2011; Stat Centric, 2011). A hybrid tracking process modeled after Blackboard and Stat Centric provided a formative assessment for the participant and the administrator. An administrative system was built into the system that had the same functions. Figure 4 is an example of a log that was used to track the activity on each site.

Figure 4. Tracking an individual's usage

Instrumental Case Study

Web-based interventions have a significantly high rate of attrition ranging from 77.5% to 99.5% (Eysenbach, 2005). To expose the human part of the phenomenon (Jacob & Furgerson, 2012), the researcher conducted an instrumental case study approach. According to Creswell (2007), an instrumental case study is when the researcher focuses on a specific issue. The specific issue for this study was attrition rates. To gain a better understanding of the issue, collecting qualitative data provided a better understanding of the phenomenon. (Neutens & Rubinson, 2002). Qualitative data provided ground zero insight to a complex issue that needed to be further understood (Creswell, 2007). To better understand compliance, the interview process took place. Semi-structured questions regarding the use of the portal provided the researcher with a deeper and richer understanding of the interface and functionalities to promote a sustained behavioral change.

To handle high attrition rates and gain a deeper understanding on how constructs from the SCT influence eating competence, the overarching interview question is; what is your idea of a Web-based eating competence program that will assist you in making a sustained behavioral change? To support the overarching interview research question, which will be asked at the end of the interview, the following sub questions were applied.

Sub-questions for participants that completed the study

1. Thinking back to the 30-day study, tell me about the activities you viewed and completed.
   a. Videos, articles, action activities
   b. Which activities did you find most beneficial and/or least beneficial to gaining eating competence?

2. As the days elapsed, tell me about what kept you motivated to complete the study.
   a. Interest in the study
   b. The incentive to earn as many points as possible
   c. Potential to earn the grand prize

3. As you viewed the various forms of content, tell me about the activities in the web portal that captured your attention.
   a. Videos, articles, action activities, other functionality

4. Tell me about any changes in your eating competence now that the study has concluded.
   a. Food choices
   b. Making time for meals
   c. Attitudes
   d. Understanding of what you are eating

5. Reflecting on the articles you read on this site, tell me about your perspective of the content.
   a. Clear and concise content
   b. Recommendations

Sub-questions for participants that did not complete the study

1. When you registered and became aware that the study was about eating competence, tell me about your expectations of the study?

2. Once you registered, tell me what you liked about the web portal?
   a. Look and feel of the interface
   b. Navigating the site
   c. Available activities

3. Once you registered, tell me what you did not like about the web portal?
   a. Look and feel of the interface
   b. Navigating the site
   c. Available activities

4. Thinking back to the 30-day study, tell me about your experiences using the web portal.
   a. What kept you from returning on a regular basis to complete the study?
   b. If you did return on a regular basis, tell me about what kept you from completing the post assessment?

5. Even though the study was not completed, tell me about what has changed regarding your eating competence?
   a. Food choices
   b. Making time for meals
   c. Attitudes
   d. Understanding of what you are eating

Sub-question for the software developer

1. Tell me more about your views, perspectives, and thoughts on using the Internet as a resource to manage eating competence.
    a. Reaching an expanded target population
    b. Cost effectiveness

2. Tell me about how the available software functionality, health behavior theory, and frameworks can intertwine to make a system that is meaningful and purposeful for the participant.
    a. Rewards
    b. Practice
    c. Observed learning
    d. Cues to action

3. Tell me about the functionality you anticipate being available in the near future to improve healthy behaviors using a web portal.
    a. Changing attitudes
    b. Compliance

To verify the most accurate information was obtained from the interview process, triangulation took place. Sevigny (1978) refers to triangulation as a process where three methods or viewpoints are employed to view a situation. For this study triangulation took place with audiotapes, interviews, and a review of the interview questions by an expert in the field for face validity.

The purpose of the interview protocol was to better understand the various aspects of the human experience (Jacob & Furgerson, 2012). Interview questions were based on the research literature. Since the phenomenon for this study was attrition rates, the literature on attrition rates guided the interview questions (Jacob & Furgerson, 2012). To keep the interview on track, the researcher developed probes/prompts (Jacob & Furgerson, 2012). These probes/prompts were formatted as bullet-points under the question.

Through semi-structured questions, the researcher gained a greater understanding of the process that took place during the intervention. The semi-structured questions were asked face-to-face (Creswell, 2007). All interviews were audiotaped and then transcribed. Audiotapes of the

interviews were kept in a secure place and have been destroyed. Participants were presented with a consent form to ensure permission to ask questions and an agreement to participate in the study.

Inquiries into the perceptions the participant had about the site were explored. To do this, a purposeful sampling strategy was employed (Creswell, 2007). Participants who were asked to be interviewed completed the intervention, registered and participated but did not complete the intervention, and registered and did not actively participate in the study. Participants were contacted through an email approved by the Southern Illinois University, Carbondale human subject committee asking her/him to participate in a face-to-face interview or an interview over the computer. The interview sought to understand the feelings, emotions, and thoughts of the participants to get a better perspective on what modifications needed to be addressed so the web portal could meet the greater needs of future participants (Shank, 2006).

These perspectives were extracted through coding. Coding is a process where the researcher makes notes of implicit and explicit events (Shank, 2006). These notes or codes are then placed into categories (Shank, 2006). As the categories begin to develop, themes begin to emerge. The formation and analysis of the themes provided information that assisted the researcher in obtaining an understanding of the phenomenon (Shank, 2006).

Since the focus of the research was on the impact of a web portal to make a sustained behavioral change, the format of a semi-structured interview provided the opportunity to analyze the process (Cohen & Crabtree, 2006). To ensure reliable and comparable qualitative data was collected, the researcher produced interview guides that had clear directions and consisted of open-ended questions (Cohen & Crabtree, 2006). To ensure face validity, an expert in the field reviewed the interview guides. Since the interview was structured, the interviewer obtained the

participant's perspectives on the process involved in navigating the web portal, which will aid in the development of an improved web-portal (Neutens & Rubinson, 2002). To keep questions from being too detailed, complicated, and/or difficult to answer, the researcher incorporated the phrase, "tell me about" to leave room for ideas, impressions, and concepts that had not been considered (Jacob & Furgerson, 2012).

Three interview guides were developed. One interview guide asked a series of questions to participants who registered and completed the study. A second interview guide asked questions to participants who registered and did not complete the study. When reporting the data from these two purposeful samples, the researcher indicated if responses came from the control group or the experimental group. Both of these interview guides will also had a component that asked questions about the use of a web portal and what expectations she/he would have to maintain compliance with the portal.

The third interview guide was for the software developer. Some general questions were developed to ask the software developer however, more specific questions were developed once the data from the interviews had been coded and themes extracted. The purpose of this protocol was to have the software developer provide more insight regarding the phenomenon based on the perspectives of the participants.

Expected themes to emerge were the dosage/amount of time needed to be a part of the study, the registration process, and intrinsic motivation to regularly navigate the site. A part of dosage is for the participant to navigate the site for approximately 15-30 minutes per week. When the participant entered the system there were four modules to choose from that contained videos, articles, and action activities. Action activities were only available for the experimental

group. Also available to the experimental group was a goal setting section and the receipt of points for completing activities.

At the time of the interview, the participant was asked questions about her/his experience on the web portal. Participants in a face-to-face interview were provided with a consent form. Individuals who were interviewed through a remote process would have been emailed a consent form and had the option to return the form via email or a picture of the signed form sent to the researcher would have been accepted. Consent forms and recording of the interview were kept in a secure location under lock and key. Interviews recorded using a computer were transferred to a jump drive and stored in the same secure location. Recordings on the computer were deleted. Now that the study is complete, all recordings have been destroyed.

There is also an inquiry about the registration process and how it needs to be clear and concise. If a participant was frustrated with the process that took place to register, was she/he deterred from the site? During the initial login, the system directed the participants through a registration process, health appraisal (pretest), and human subject's approval.

To motivate participants, each week day registered participants received a, "tip of the day". The "tip of the day" was a cue to action providing an incentive or reminder to log in to the site. To better understand the participant's experience, the interview guide for the semi-structured interview inquired about the components of the intervention and what was felt.

In an effort to further motivate participants to be active on the site an incentive was provided. The incentive was a donation to a local food cupboard. A question in the interview guide addressed this incentive to learn more about the significance of raising money for an organization.

When minimal participation was recognized, a second incentive was provided. This time it was a personal reward. Individuals who completed the study were eligible for either a $100 gift card to a local grocery store or a $50 gift card to a store that provides nutritional supplements. An inquiry become, what were the perspectives and perceptions of these rewards to the participant to increase motivation?

As the intervention progressed, additional issues surfaced. One issue was the flow of activities. As a participant navigated the site were the activities and functionalities working the proper way? Since there was an experimental group and control did the type of content have an influence on compliance, thus impacting attrition rates? What were the participant's perspectives? Were there parts of the site that were confusing or unclear? The database also indicates individuals who registered and then did not go back onto the site or had limited activity. It was be ideal to find out why. Was it a lack of time, incentive?

Website Intervention

To maintain construct validity, the Web-based platform had content to promote eating competence (Trochim, 2006). Content for the intervention was guided by the four components of ecSatter: eating attitudes, food acceptance, regulation of food intake and body weight, and management of eating context (Satter, 2007b). The framework for the intervention was based on the constructs from the SCT. Webpage layouts for content in the Web-portal was modeled after the template displayed in Figure 5. The template below was developed based on insight from the web developer.

Figure 5. Landing page design

Information-based material was a part of the content available on the Web-portal.

Participants had several articles, videos, activities, and other informational-based media related

to increasing eating competence. Content for the Web-portal was designed to provide an increase

in self-efficacy through behavioral capabilities (practice), observational learning experiences,

self-regulation, emotional coping response, outcome expectations/expectancies, and rewards for

positive behaviors. All content was in support of encouraging eating competence based on

construct of the SCT.

ecSatter Components in a Web-based Platform

There were five sections where content could be accessed. In the section *Understanding*

Eating, the participant was exposed to the first ecSatter component eating attitudes. Content in

the *Understanding Eating* section focused on an individual's attitude towards eating. An

example of content that was in *Understanding Eating* is provided in Figure 6 located in Appendix A. The title of the article is *Everyday Eating Tips* and there are a series of subarticles a participant can view. Participants had access to an *Interactive Activity* where the individual was able to practice a skill, observe a skill, and/or be reinforced to build his/her perceived self-efficacy. An example of an *Interactive Activity* was*: "Do Not Go Shopping When Hungry"*. A description of the activity is found in Figure 7 located in the Appendix A.

The second section was called *Give It A Try* and this section provided content based on the second ecSatter component called food acceptance. An example of the page layout for Give It A Try is found in Figure 8 located in the Appendix A. In this section there was a variety of foods the participant was encouraged to try to enhance her/his food selection (Satter, 2007). An example of content for the *Give It A Try* section is displayed in Figure 9 located in the Appendix A. The content was named, "Throw a Change-up for Breakfast." It was a video on how to include healthy foods in your breakfast that also taste good.

A third section titled, *Eat What You Need* modeled ecSatter's third component, regulation of food intake. In the *Eat What You Need* section content was designed to provide information and skills to regulate hunger, appetite, and satiety (Satter, 2007). Figure 10, located in Appendix A, provides a layout of the subsections.

An example for one of the subsections was titled, "Weight Loss Program." In the Weight Loss Program subsection, participants were given information on a safe and successful weight loss program. Individuals had an Interactive Activity to develop self-efficacy skills. An example of an activity is in Figure 11. "Body Image: It's a Point of View." It was checklist a participant used to better understand his/her perceived body image. Once the particpant finished the Action Activity it was submitted for points (reinforcemnent/rewards). During the peer review process,

the comments suggested the activity needed to be more clear and concise. Due to this, the

activity was removed from the intervention. See comments in Table 4: *Peer Review Content*

Validity Conclusions.

Body Image: It's a point of view

Use the checklist below to evaluate the meaning of pictures and videos you see on the Internet, in magazines, and/or on television.

Evaluating Images	YES	NO
Do you see a wide range of body images in media sources?		
Are the visuals you see typical of the general population?		
Do you believe visuals have been altered in some way to make the individuals look more attractive?		
Do the visuals you see make you feel dissatisfied with your body?		
Are people influenced by the visuals seen in media sources?		

In three to four sentences, indicate how you think you can see beyond what the visuals portray to feel comfortable about your body?

_____

_____

_____

_____

_____

E-mail this form to receive 15 Wellscore points.

Figure 11. Action activity: "Body image: It's a point of view"

The fourth section was titled *A Balanced Eating Plan* and modeled the ecSatter

component eating context. Eating context focuses on setting a time for family meals and having

the skill to plan a healthy menu (Satter, 2007). Figure 12 displays the Web-page layout for *A*

Balanced Eating Plan section.
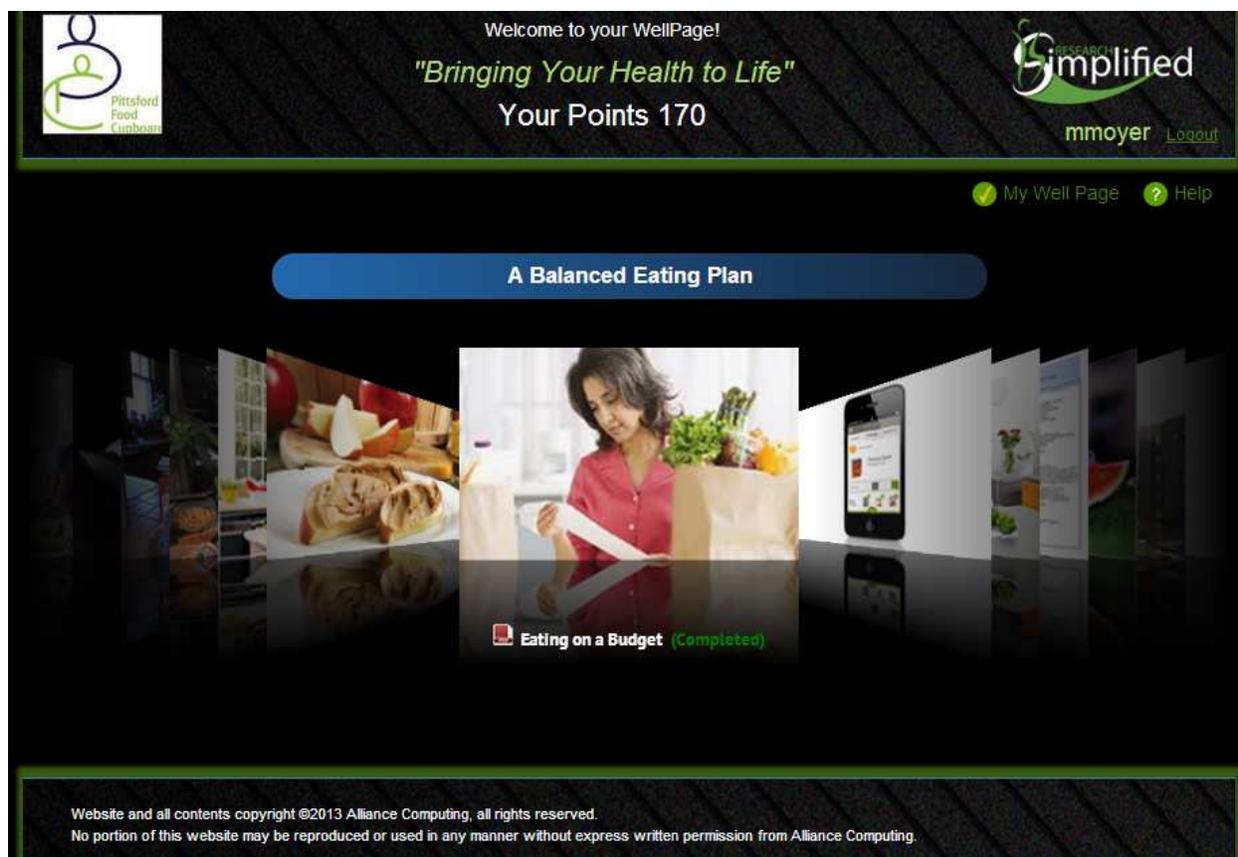
Figure 12. Page layout for a balanced eating plan section

Content for this section focused on buying the appropriate foods, strategies to have the proper food available, and making time to eat as a family. An example of content for *A Balanced Eating Plan* section was titled "Five Dieting Myths". "Five Dieting Myths" is a video that provided information on myths that individuals face when making a change in food choices. These myths were clarified in the video. Figure 13, located in Appendix A provides an image of the page.

Health Assessment is the last section on the landing page. In this section, the participant was able to access the pretest and posttest appraisal inventory. The *Health Assessment* was only active upon initial registration and when the 30-day study had concluded.

Functions within the Content

The Web-portal had a variety of articles, videos, and activities that coincided with gaining eating competence. Figure 14 provides an example of how an article appeared. At the top were icons that gave the participant options on how to view the article. Participants printed the article, viewed pages side-by-side, and increased the size. To read the article, participants dragged the scroll bar up and down. If participants liked an article it could be added to his/her favorites by clicking on "Add to Favorites." Articles were available throughout the duration of the intervention and articles could be reviewed at any time, if needed.

Tracking for the viewing of each informational piece was available in the content management system (CMS). To verify an article had been read, the individual had to scroll to the bottom of the article. For a video, completion of watching the video registered once 85% of the video was viewed. Content choices are in a matrix titled *Thirty Days of Content* and are located in Appendix F.
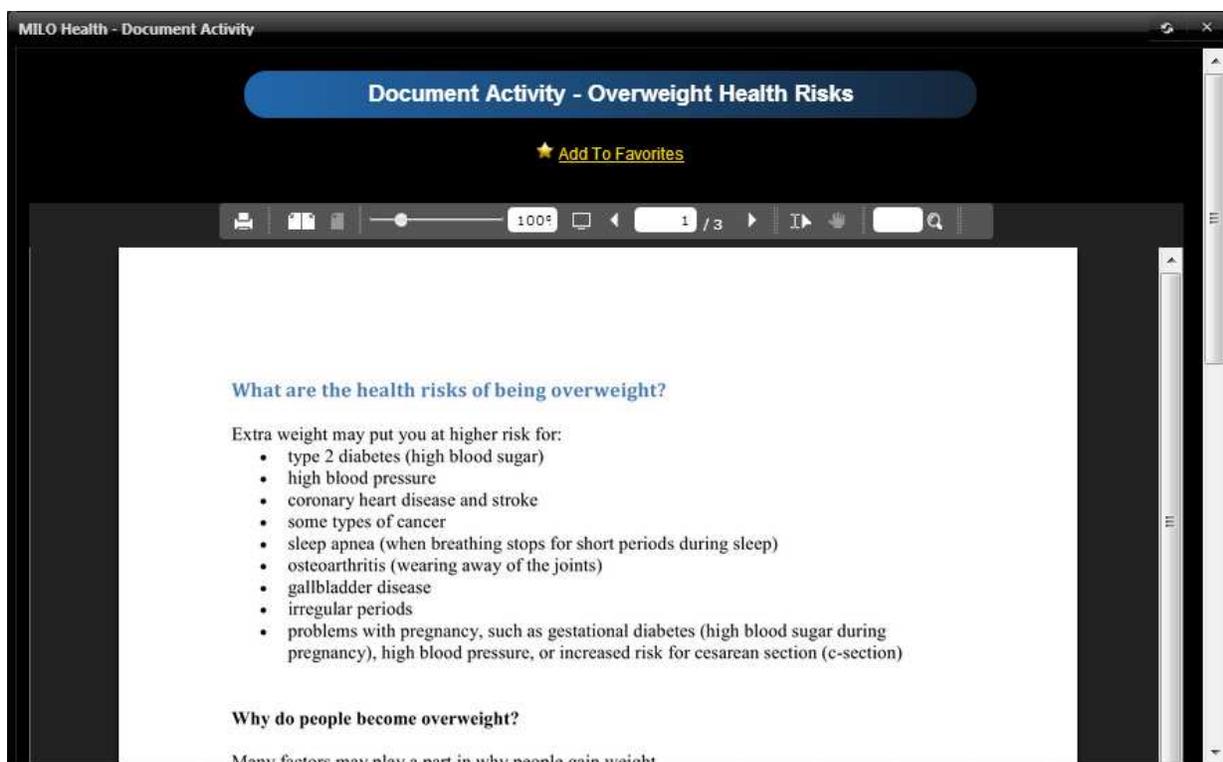
Figure 14. Article template for content in the control group

Content for the Web-portal was guided by the four components of ecSatter: eating

attitudes, food acceptance, regulation of food intake and body weight, and management of eating

context (Satter, 2007b). Content available was informational-based material and a myriad of

activities designed to provide an increase in self-efficacy through behavioral capabilities

(practice), observational learning experiences, self-regulation, emotional arousal, outcomes

expectancies/expectations, and reinforcement for positive behaviors. Since the SCT is a broad

behavioral theory, it was a challenge to incorporate all constructs equally in this study. For this

study, the constructs from the SCT were used concurrently in support of encouraging eating

competence however, a majority of the content was developed based on the constructs of

behavioral capabilities, observational learning, and reinforcement.

Behavioral Capability Construct

To provide a participant with an opportunity to practice being eating competent (behavioral capabilities), there was a combination of written content in the form of written instructions, diagrams, and images. These tools were available to enable the participant to practice the skill. Activities for this intervention ranged in variety and aligned with the four components of ecSatter: food attitudes, food acceptance, regulation of food intake and body weight, and management of eating context (Satter, 2007b). Performance and the practicing of the skill was the indicator that learning and interaction was taking place.

In the left-hand sidebar of the landing page, there were a variety of activities for the participant to choose. In the center of the web page there was a featured activity. The participant chose to review and practice the feature activity or chose an activity from the column to the left. There was a brief introduction to the activity and a systematic progression to work towards proficiency. Each activity was followed by a formative evaluation. The formative evaluation was in the form of a Likert scale indicating the participant's perception of the activity.

For tracking purposes, an activity that was not active or viewed with no other advancements did not have a point value rewarded. If the activity was accessed, the participant received the designated point value towards their Wellscore total. To acquire the points, the participant had to watch 85% of the video or scroll to the bottom of the article.

ecSatter provided several components related to food acceptance and planning for a meal. One example of an activity to practice eating competence was to cook a healthy meal. Healthy meals that are balanced in nutrients will sustain a participant's need for additional food. When the participant clicks on the healthy cooking activity, a page appeared with the protocol to cook a healthy meal. The design of the session was similar to a lesson plan. There was a brief overview

of what was involved in the skill development followed by the knowledge needed to achieve the

skill. From here, there was a skill development activity to practice cooking a healthy meal.

Figure 15 is a template of how the webpage appeared.

Figure 15. Template of healthy cooking activities

Upon the completion of the skill development session, the individual was directed to

demonstrate how the skill was transferred to various other settings and surroundings. The

procedure employed a semantic differential scale (Dignan, 1995). The self-reported measurement

evaluation provided the participant with feedback about his/her progress. Upon the conclusion of

the practice session, the participant rated the experience. An evaluation similar to the model

shown in Figure 16 was available for the participant to provide a formative evaluation of the

experience and provide evidence of completion.

Figure 16. A semantic differential scale to assess a participant's progress

A second example of an activity where eating competence was fostered is in the production of a food and beverage analysis. The objectives for the activity was for the participant to decide if she/he buys food and beverage items that are reasonably nutritious in an adequate amount (Satter, 2007b). To start, the participant went shopping for his/her food and beverage items. When the participant came home, she/he used the receipt to list all the food and beverage items purchased on the form provided in Figure 17. At this point, the participant reviewed all the food and beverages purchased and indicated, on the form, if the items were *reasonably nutritious* or *not reasonably nutritious*. In addition, the participant indicated if the amount bought was an *adequate amount* or an *inadequate amount*. Once all the items were evaluated, the participant rated their overall food and beverage experience on three different semantic differential scales. The first scale had a continuum providing a range from *not reasonably nutritious* to *reasonably*

nutritious. A second scale had a continuum ranging from *inadequate amount* bought to *adequate amount* bought. The third semantic differential scale was a culminating continuum ranging from *unsatisfied* with the shopping experience to *satisfied* with the shopping experience.

Figure 17. Form to indicate if items are reasonably nutritious and an adequate amount

At the conclusion of the participant-center activity, the participant was able to decide if the grocery items bought was reasonably nutritious and of an adequate amount. The expectation was the next time the participant purchases items from the grocery store she/he would have more awareness regarding the items being purchased. Another expectation was when the participant made better choices, his/her level of self-efficacy increased and they would have an experience in self-regulation because a judgment was made.

Observational Learning Construct

Employing the observational learning construct, the Web-based platform presented nutritional coaches as a means to increase eating competence. The goal for this construct was for the individual to develop self-efficacy skills by observing another person performing the skill. To foster eating competence and self-efficacy skills, the participant had access to a variety of videos organized into a series with a nutrition consultant addressing strategies to increase eating competence. Participants received strategies to end an eating episode (satiation) and to set aside eating (satiety). All observational learning experiences was positive in nature.

Incorporating the self-regulation and outcome expectancy construct, each video session was designed to motivate the participant and provide a mental image of what positive eating habits look like (Bandura, 1998). Here, individuals were able to differentiate between his/her current eating habits and the eating habits that he/she would prefer to have. Several videos were available to view. The series of videos had an introduction to the skill and then the participant was able to view another video where the actor/actress demonstrated the skill.

The pre-recorded videos allowed the participant to visually see and hear how eating competence is attained. Each video focused on a different aspect of eating competence. For example, a video of an individual ordering a meal at a restaurant provided strategies to take the proper steps to put half of the meal in a to-go container when the meal first comes and then given to the individual at the end of the meal. Provisioning of this nature stays within the boundaries of the ecSatter model with the intention to increase self-efficacy and increase eating competence (Bandura, 1998; Satter, 2007b).

A second video session was designed to accommodate the purchasing of food at the grocery store. The consultant demonstrated how to put together a grocery list and then

demonstrated going to the store and actually executing the action of being in the store making the choices on the list and avoiding the tempting choices. To better self-regulate actions and control emotional arousal, the participant was able to observe the consultant's actions and body language (Bandura, 1998). Body language was in the form of expressions on the consultants face and posture as a temptation is encountered and the positive expressions and body posture when a choice is made from the list. The non-verbal communication signals were designed to promote a positive behavioral observance.

For tracking purposes, an activity that was not active or had not been viewed with no other advancements did not have a point value rewarded. If the activity had been accessed, the participant received the designated point value towards their Wellscore total. To acquire the points, the participant watched at least 85% of the video. Figure 18 is an example of a video template used to encourage observational learning.

Figure 18. Example of a template to encourage observational learning

Rewards and Incentives

Additional content focused on reinforcement and rewards to indicate a behavioral change. Participants were rewarded for their positive behavior to encourage a repeated action. Reinforcement came in the form of complements, rewards, self-talk, and goal completion (Bandura, 1998). If a participant achieved the goal she/he chose to pursue, the result was greater learning, retention, and interest (Baranowski, Perry, & and Parcel, 2002).

To motivate the participants and provide them with an incentive to stay involved in the intervention, a reward system was intertwined. Reinforcement came in the form of complements, rewards, points, statements of encouragement, earned incentives, and recognition for completing set goals.

Under each goal was a sliding scale where the individual indicated how much of the goal they felt they could complete. The scale modeled the Likert Scale. When a goal was achieved, points were awarded. Figure 19 is an example of a template to set goals.

Figure 19. Setting monthly goals

Based on the ecSatter Model, the participant was able to set boundaries to regulate food intake (Satter, 2007b). First, the participant developed an overarching goal. To work towards achieving the overarching goal, the participant developed a daily plan of action that included three sub-goals related to the overarching goal. The sub-goals were areas the participant felt were necessary to execute and achieve the overarching intended goal. The next time the participant visited the site she/he rated her/his success towards the sub-goals on a sliding scale with integers ranging from zero to 10. Once the values for each goal were determined on the sliding scale, the participant clicked "save" and then produced three new sub-goals that guided his/her progress towards the overarching goal. Since the participant self-monitored her/his progress, values that were inputted were based on the participant's perception.

On the scale of 0 to 10, if the individual rated his/her progress between 0-4 they received no points and a cue to action message appeared. A rating from 4.1-7 awarded 1 point and a message to encourage improvement was displayed. A rating of 7.1-9 awarded 2 points and a message of approval was displayed. If a participant indicated a rating of 9.1-10, the participant received a 3-point credit and a message of excellence was displayed. The participant's point total was displayed and color-coded to indicate the participant's progress.

Via e-mail, each day the participant received a message of encouragement and a point total. The messages for the intervention were coded according to the level of progress indicated and stored in the content management system's database. Figure 20 displays a template of how the point system was displayed to the participant.

Figure 20. Webpage displaying points

Making the reinforcement user-centered provided a greater chance for the individual to commit (Kramer, Noronha, & Vergo, 2000). Each time the participant set a goal to gain eating competence, the interventions' reward points automatically distributed points to the participant. The tool used to record the participant's points was called a wellness scorecard. A cumulative report was displayed to provide positive feedback and encouragement.

Several examples of overarching goals were available for the participant to choose from or the participant had the option to create their own goal. For example, an individual may have chosen one of the available goals focusing on weight management. Weight management is the ability to maintain a weight that does not present any health risk (Pruitt, Allegrante, & Prothrow-Stith, 2010). A goal for weight management read, "In the next five days I will lose five pounds by eating a minimum of five servings of fruits and vegetables a day". With the goal stated the participant was responsible for selecting three sub-goals to complete on a daily basis that supported the intended goal. To do this, three fields were available to write in the intended sub-

goals. Once the sub-goals were inserted, the participant clicked on the "Ready to achieve my goal." button and the database saved the information. For each day of the term, for the stated goal, the participant self-reported their progress and each day created new sub-goals that kept the participant on task and working towards achieving the overall goal.

Since the list of goals available was not comprehensive, the participant had the option to create a tailored goal. From the pull-down menu, the participant selected "Create my own goal". What appeared is a field where the individual was able to write in and save their goal. Once the goal was written and saved, the three sub-goal fields appeared and the participant needed to complete the sub-goals for each day of the term.

Demographics

At the end of the health assessment there was a section reserved to collect information on the demographics of the sample. The participants' height, weight, age, gender, income range, and profession were collected. In addition, the following questions were asked (1) Are you currently in any medical programs? (2) Are you currently in a behavioral change program? (3) Are you currently involved in a program that is designed to change your eating habits (Jenny Craig, Nutrisystem, Slim Fast)? (4) In the last 30 days, have you tried to change your eating habits? (5) On most days, from where do you plan on logging into the website (home, public place, mobile unit, workplace)?

Response Rates

Response rates for a study can range from 20% (Creech, 2011) to 35% (Kittleson, 1997). If an e-mail reminder is sent, the response rate for a e-mail survey could double (Kittleson, 1997). Eysenbach (2005) reported 0.5% to 22.5% of the sample population completed a web-based intervention study. For this study there was a total of 22,612 residents 18 years and older

that were available for the study. A response rate ranged from 114 (0.5%) to 7,914 (35%) participants. Twenty percent was the estimated response rate for this study. Indicating, this study had a potential sample size of approximately 4,522 individuals.

Pilot Study

Upon approval from the dissertation committee and the Southern Illinois University, Carbondale human subjects committee, a pilot study was conducted. The pilot study indicated if the design of the study was properly aligned to be valid, reliable, and useable (Dignan, 1995). During the pilot study, the researcher examined the data collection instruments, data collection procedures, the evaluation design, and the functionality of the web-based intervention (McDermott & Sarvela, 1999).

For this study, a basic flow from one activity to the next and the transition between strategies was monitored. The potential for system errors and the functionality of the data-gathering program were additional areas to monitor. Time was allotted to make changes that fine-tuned the web-based intervention to be effective and efficient.

Participants for the pilot study came from the employees of the town where the study took place. This town was currently in the process of developing a wellness program for their 300+ employees and the wellness coordinator agreed to have the pilot study conducted with their employees. Since the town was providing access to resources to promote the primary study, town employees to pilot the study was a practical fit. Approval for participation was contingent on a review from the information technology (IT) staff employed by the town. With approval granted, the pilot study was initiated. Since participation was confidential, it is not known if the three members of the IT staff participated in the pilot study. All data that was collected and analyzed was offered to the town's wellness coordinator.

Instrumentation

    ecSatter Inventory

    A measure was needed to indicate when a participant began the 30-day study and when participation concluded. In addition, a measure on eating competence took place. To measure eating competence of participants, the researcher implemented Satter's ecSatter Inventory (ecSI) (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007; Stotts & Lohse, 2007). To minimize bias with the instrument, Bandura (2006) suggested replacing the title to *Appraisal Inventory* with eliminate predisposing perspectives. Validated in a large sample from the general population (N=863), construct dimensionality and validity were confirmed by factor analysis and comparison to validated instruments (Stotts & Lohse, 2007). The 16-item ecSI questionnaire was designed to empirically assess the constructs of the ecSatter Model (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007; Satter, 2007). Based on functional eating attitudes and behavior (Satter, 2007), the four constructs were as follows: (1) eating atitudes (2) food acceptance (3) internal regulation, and (4) contextual skills (Stotts & Lohse, 2007). Table 1 provides the ecSatter Inventory constructs, subscale items, and point values.

Table 1

ecSatter Inventory Constructs, Subscale Items, and Point Values

ecSatter Constructs	Subscale Items	Point Values per Item
Eating Attitudes (Understanding Eating): **Is positive about eating and food.**	1. I am relaxed about eating.	0-3
	2. I am comfortable about eating enough.	0-3
	3. I enjoy food and eating.	0-3
	4. I am comfortable with my enjoyment of food and eating.	0-3
	5. I feel it is okay to eat food that I like.	0-3
Food Acceptance (Give it a Try): **Is comfortable with preferred foods and has skills for learning to like unfamiliar foods.**	1. I experiment with new food and learn to like it.	0-3
	2. If the situation demands, I can "make do" by eating food I don't much care for.	0-3
	3. I eat a wide variety of food.	0-3
Internal Regulation (Eat What You Need): **Depends on internal regulators of hunger and appetite as well as feelings for fullness and satisfaction to determine how much to eat.**	1. I assume I will get enough to eat.	0-3
	2. I eat as much as I am hungry for.	0-3
	3. I eat until I am satisfied.	0-3
Contextual Skills (A Balanced Eating Plan): **Makes meals a priority and has skills and resources to manage food.**	1. I tune into food and pay attention to myself when I eat.	0-3
	2. I make time to eat.	0-3
	3. I have regular meals.	0-3
	4. I think about nutrition when I choose what I eat.	0-3
	5. I generally plan for feeding myself. I don't just grab food when I am hungry.	0-3

Using a Likert-scale, the level of measurement using an ordinal scale preceeded from

always, *often*, *sometimes*, *rarely*, or *never* (Lohse, Satter, Horacek, Gebreselassie, & Oakland,

2007). Values were assigned as follows: (1) a choice of *always* receives a score of 3; (2) a choice

of *often* receives a score of 2; (3) a choice of *sometimes* receives a score of 1; and (4) a choice of

rarely or *never* receives a score of 0 (Lohse, Satter, Horacek, Gebreselassie, & Oakland, 2007).

Scores for the ecSI can range from 0-48 (Lohse, Satter, Horacek, Gebreselassie, & Oakland,

2007). Permission to use the ecSI took place through an application and approval process.

Permission was granted on September 19, 2011 by Ellyn Satter Associates. The application is

available in Appendix A.

Marlowe-Crowne Social Desirability Scale

When an individual was completing a survey, there was the potential for the individual to

exaggerate his/her personality strengths and deny his/her personality weaknesses (Crowne and

Marlowe Social Desirability Scale, n.d.). To control for the bias that may have occurred, this

study intertwined 13 social desirability items into the ecSatter instrument. The 13 items are a part

of a short form developed and tested for validity and reliability by W. M. Reynolds (Reynolds,

1982). Participants responded with a "true" or "false" response. The 13-items are presented

below.

1. It is sometimes hard for me to go on with my work if I am not encouraged.

2. I sometimes feel resentful when I don't get my way.

3. On a few occasions, I have given up doing something because I thought too little of my ability.

4. I am sometimes irritated by people who ask favors of me.

5. No matter who I'm talking to, I'm always a good listener.

6. There have been occasions when I took advantage of someone.

7. I'm always willing to admit it when I make a mistake.

8. I sometimes try to get even rather than to forgive and forget.

9. I am always courteous, even to people who are disagreeable.

10. I have never been irked when people expressed ideas very different from my own.

11. There have been times when I was quite jealous of the good fortune of others.

12. I have never deliberately said something that hurt someone's feelings.

13. There have been times when I felt like rebelling against people in authority even though I knew they were right.

Table 2

ecSatter Inventory (ecSI) items with Crowne and Marlow Social Desirability(CM) Short Form C items

Item	Response Choices Always (A), Often (O), Sometimes (S), Rarely (R), Never (N), True (T), False (F)				
I am relaxed about eating. *(ecSI)*	A	O	S	R	N
I am comfortable about eating enough. *(ecSI)*	A	O	S	R	N
It is sometimes hard for me to go on with my work if I am not encouraged. *(CM)*		T		F	
I sometimes feel resentful when I do not get my way. *(CM)*		T		F	
I enjoy food and eating. *(ecSI)*	A	O	S	R	N
I am comfortable with my enjoyment of food and eating. *(ecSI)*	A	O	S	R	N
I feel it is okay to eat food I like. *(ecSI)*	A	O	S	R	N
On a few occasions, I have given up doing something because I thought too little of my ability. *(CM)*		T		F	
I experiment with new food and learn to like it. *(ecSI)*	A	O	S	R	N
If the situation demands, I can "make do" by eating food I don't much care for. *(ecSI)*	A	O	S	R	N
I eat a wide variety of food. *(ecSI)*	A	O	S	R	N
I am sometimes irritated by people who ask favors of me.		T		F	
I assume I will get enough to eat. *(ecSI)*	A	O	S	R	N
No matter who I am talking to, I am always a good listener.		T		F	
I eat as much as I am hungry for. *(ecSI)*	A	O	S	R	N
There have been occasions when I took advantage of someone. *(CM)*		T		F	
I eat until I am satisfied. *(ecSI)*	A	O	S	R	N
I'm always willing to admit it when I make a mistake. *(CM)*		T		F	
I sometimes try to get even rather than to forgive and forget. *(CM)*		T		F	

Table 2 continued

I tune into food and pay attention myself when I eat. *(ecSI)*	A	O	S	R	N
I am always courteous, even to people who are disagreeable.		T		F	
I make time to eat. *(ecSI)*	A	O	S	R	N
I have never been irked when people expressed ideas very different from my own. *(CM)*		T		F	
I have regular meals. *(ecSI)*	A	O	S	R	N
There have been times when I was quite jealous of the good fortune of others. *(CM)*		T		F	
I think about nutrition when I choose what to eat. *(ecSI)*	A	O	S	R	N
I have never deliberately said something that hurt someone's feelings. *(CM)*		T		F	
I generally plan for feeding myself. I don't just grab food when I am hungry. *(ecSI)*	A	O	S	R	N
There have been times I felt like rebelling against people in authority even though I knew they were right. *(CM)*		T		F	

SMOG Readability Formula

Reading content for the site needed to be at an appropriate level of comprehension. For this study, reading material was evaluated to verify it was at middle school level. To do this, a SMOG Readability Formula was employed. G. Harry Mc Laughlin developed and then published the SMOG Readability Formula in May of 1969 (McLaughlin, 1969). In 1961, McLaughlin validated the formula using the *McCall-Crabbs Standard Test Lessons in Reading* (McLaughlin, 1969). Once the formula was validated, standard error was calculated at 1.5 grades meaning "the formula will predict the grade of a passage correctly within one and a half grades in 68 percent of cases" (McLaughlin, 1969, p. 643).

The conventional method is to follow a formula to assess the grade level of readability. There are three steps and a formula to follow to calculate the reading grade level. With SMOG: (1) Count at least 10 sentences from the start of a text, 10 from the middle, and 10 from the end; (2) in those sentences, count the polysyllables (words of 3 or more syllables); and (3) calculate

reading level using the formula below (Word Count: SMOG, 2009). In addition, an online

SMOG calculator can be accessed at http://wordscount.info/wc/jsp/clear/analyze_smog.jsp.

$$\text{grade} = 1.0430\sqrt{30 \times \frac{\text{number of polysyllables}}{\text{number of sentences}}} + 3.1291$$

Content Validity

Content validity is a subjective process to establish a representative sample (Burns,

1996). Content validity indicates the material is true and appropriate for the sampling process

(Burns, 1996). For this study, the representative sample was Web-based content for the control

group and the experimental group. A panel of subject matter experts assessed content validity for

this study (Burns, 1996). Neutens and Rubinson (2002) indicated a four to eight person group is

an adequate size. Subject matter experts were asked to review the material on the sites and

provide specific feedback. This process took place before the study was pilot tested. The content

review of the instrument for validity demonstrated the content was appropriate for the study.

Figure 21 provides the form to assess content validity.

Experimental Group Content Validity Verification

Below is a checklist of the sections and subsections for the experimental group. Since my study will be based on the constructs of the SCT with a primary focus on self-efficacy, observational learning, behavioral capabilities, and reinforcement I would like to have your expert feedback on the content validity. If you agree with the proposed related construct to the content in the section, please check the "yes" column. If you disagree with the proposed related construct for the content in the section, please check the "no" column. The "Comments" column is for any additional feedback you would like to provide. Thank you for your time and expertise on this matter.

Website Sections	Subsections	Primary Researchers Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments
Understanding Eating (Eating Attitudes)	Eat Right	Behavioral Capabilities, Reinforcement			
	Everyday Eating Tips	Behavioral Capabilities, Reinforcement			
	Fats Just For You	Observational Learning, Reinforcement			
	Whole Grain Is Fine	Observational Learning, Reinforcement			
Give It A Try (Food Acceptance)	Food From Around The World	Observational Learning, Reinforcement			
	Throw A Change-up For Breakfast	Observational Learning, Reinforcement			
	Something Fishy About Vitamin D	Observational Learning, Reinforcement			
Eat What You Need (Internal Regulation)	Finding A Balance	Observational Learning, Reinforcement			
	Accepting Your Body Weight	Behavioral Capabilities, Reinforcement			
	Put Some Aside	Observational Learning, Reinforcement			
A Balanced Eating Plan (Contextual Skills)	Healthy Eating and Physical Activity	Behavioral Capabilities, Reinforcement			
	Grocery Receipt Challenge	Behavioral Capabilities, Reinforcement			
	Half Plate Strategy	Observational Learning, Reinforcement			
Totals					

Figure 21. Content validity verification form

Data Collection

Individuals willing to participate in the study were randomly assigned to one of two intervention groups. Participants 18 years and older were solicited. Participants were individuals from a population living in the township, looking to gain eating competence, and having access to a technological device with Internet access. Since participants were from a community with defined demographics, results from the study may not be generalized to the entire population.

For a participant's involvement in this study to be valid, there was a minimum amount of dosage that needed to be attained. Since the dosage for a Web-based intervention to be effective varies (Bernhardt, 2001; Cook, Billings, Hersch, Back, & Hendrickson, 2007), dosage for this study was for the participant to login on four different days within the first seven days and complete at least three activities on the site during each login session. A participant's dosage was verified by the platforms database. The database had the functionality to time-date stamp each login session and log the sessions completed by the participant. Only the data from the participants with the minimum amount of dosage were analyzed.

Data Interpretation

To expose the human part of the phenomenon (Jacob & Furgerson, 2012), the researcher incorporated an instrumental case study approach. To better understand compliance and attrition rates, the interview process took place. Semi-structured questions were the foundation for the six interviews. Interviews were recorded using a QuickTime Player version 10.2 on a MacBook Pro, OS X, version 10.8.5. When the interview was complete, the file was exported and saved as either an audio file or a movie file. Each file was saved on the internal drive of the MacBook Pro, an external drive, and a remote server. Each interview group had a separate interviewing guide, but all three groups had the same overarching question, "What is your idea of a Web-based eating competence program that will assist you in making a sustained behavioral change?"

The protocol for transcription was as follows: (1) locate the audio or movie file (2) open the file in iTunes (audio) or QuickTime Player (movie) (3) listen to the interview and (4) create a transcript of the conversation in a Microsoft Word document. MacBook Pro is equipped with a dictation and speech application. There was an attempt to use the dictation and speech application to assist in the transcription of the interviews. Instead, the researcher played portions

of the recording, transcribe, review the transcription for accuracy, and then continue with the next portion of the interview.

When the transcriptions were complete, coding began. In a Word document, the researcher used the landscape orientation and created three columns using the *Tables* function from the Microsoft Word toolbar. Each transcript was coded separately and the next transcription was not coded until the prior transcript was completed (Saldana, 2009). With all transcripts coded, inductive reasoning continued and the attributes were conceptualized. Data analysis extracted the major elements of each interview to disclose themes that are significant attributes to the overarching/specific issue of attrition rates in an eating competence web-based portal.

Summary

The focus of this chapter was to map out and develop a web-based intervention to promote a gain in eating competence through an interactive web-portal based on a theoretical framework. A Web-portal was developed and contained functionality and content supported by the Social Cognitive Theory framework and there was content to stimulate cognitive awareness.

 All content placed in the web-portal was reviewed for face validity. A pilot study was conducted to verify the site was working properly. Solicitation of participants was organized with local government officials and by distributing information cards about the study. All activity was monitored by a database to ensure dosage was completed and participation was verified.

Data analysis was completed through an instrumental case study were participants and the software developer were interviewed. Interviews contained semi-structured questions. All interviews were recorded, transcribed, and coded. Results of the study will be discussed in chapter four.

CHAPTER 4

RESULTS

Overview

Chapter four includes a discussion on the development and implementation of an eating competence Web-based initiative. Components of the chapter include the following: feedback from the peer review and internal review, results of the pilot study, and an instrumental case study for quantitative analysis. Development of the Web-based initiative was based on the available functionality, budgetary limits, and a meaningful and purposeful interface. A peer review verified content validity and results from the pilot study indicated the system's potential validity and reliability. Prior to launching the system for the study revisions and/or modifications was made based on the results of the peer review, internal review, and the pilot study. Due to high attrition rates a quantitative statistical analysis was not possible. Focus is placed on the instrumental case study for meaning/theory on attrition rates.

Purpose for the Study

Research indicates Web-based interventions were significant in changing an individual's behavior or in achieving specified knowledge (Wantland, Portillo, Holzemer, Slaughter, & Mcghee, 2004). However, high attrition rates are associated with a Web-based study (Eysenbach, 2005). The purpose of this study was to analyze the qualitative aspects needed for a sustained behavioral change utilizing a Web-based intervention. The study exposes the human part of the phenomenon and focuses on attrition rates to better understand compliance when employing a Web-portal (Jacob & Furgerson, 2012) (Creswell, 2007).

This study was theory-based to find out how future wellness programs can be designed employing constructs from the Social Cognitive Theory (SCT) and a Web-based platform. The

findings of this study have become a foundation to conduct future research on methods that will promote enjoyable and interactive activities to sustain a behavioral change using a Web-portal. By keeping the interventions grounded in theory and engaging, the expectation is attrition rates for Web-based interventions will decrease.

Content for the Web-portal focused on four areas of eating competence and was based on the ecSatter Model. Through semi-structured interviews, the study probed participants to determine the magnitude the ecSatter Model and the SCT had towards gaining eating competence, thus adding another layer of knowledge to the literature. Tailored information and Web-based activities to promote eating competence were placed in a four-section wheel. When activated, each section or channel of the wheel opened and provided a variety of content to promote growth. In 2003, Berg, Oenema, and Campbell indicated further research was needed to understand how tailoring impacts "multiple health related behaviors based on different sources and/or communicated through different channels" (p.1033S).

Qualitative Research Questions

To handle high attrition rates and gain a deeper understanding on how constructs from the SCT influence eating competence, the overarching qualitative question becomes; what is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change? To support the overarching qualitative research question the following sub questions exist: (1) What activities/content in the Web-portal had the most impact? (2) What activities/content in the Web-portal had the most influence? (3) How do participants stay motivated when engaged in a Web-based eating competence program? (4) What type of content is needed in a Web-portal to produce a sustained behavioral change? (5) What makes the Web-portal easy to navigate? (6) What functionality needs to be included in a Web-portal to produce a

behavioral change? (7) How can the development of an eating competence Web-portal stay within the budget?

Development of the Web-based Initiative

To conceptualize the layout of the Web-based intervention, the researcher used Microsoft PowerPoint (PPT) to produce screen shots. The series of screen shots provided a "storyboard" for the web developer. Even though the creation of a "storyboard" is a timely and detailed process, it is a necessary process. When developing a Web-based initiative the more detail and specifications that are provided to the web developer the more effective and efficient the development of the product. Detailed screen shots were developed for the following pages: login, registration, pre and post-appraisal inventory, goal setting, point system, primary landing, secondary landing, and study completion. During interviews the document with the rationale and screen shots were discussed so the developer could provide an appropriate price for the project and establish an accurate timeline.

After interviewing five web development companies, Alliance Computing was hired to develop a three-tier system consisting of a user interface, web-based services, and the database (Dixon, 2012). The user interface, also known as the front-end of the site is what the viewer sees and interacts with. Web-based services are the functionality of the system designed to connect the data to websites and mobile devices, and the database connects the server to the interface.

A three-tier system prevents attacks and protects the participant's identity. Since Alliance Computing has a background and experience with developing health related interventions where personal health information (PHI) and Health Insurance Portability Accountability Act (HIPPA) compliance are a must, they were a good fit for this project.

In the planning process, several decisions were made. Of greatest concern is the security of the participant's information. Any system has the potential to be infiltrated or "hacked." To prevent an event of this nature the system was created with a Secure Sockets Layer (SSL) certificate. An SSL Certificate provides a secure upload for a webpage, encrypts information that is being delivered to and from the site via the Internet, stores a copy of the encryption, provides a secure decryption website, receives instructions to decrypt, and provides a response to decrypt (Pandrangi & Scalzo, 2012). In other words, the SSL Certificate provides a secure session with the browser.

Figure 22 provides an example of a web-bar that has an SSL Certificate (SSL Certificates: A brief explanation). Instead of an http status, a site with an SSL Certificate has an https status. In addition, the address bar turns from white to green indicating the security is being activated, the padlock is activated, and the company name is displayed. For the web portal being used in this research, Starfield Class 2 Certification Authority is the trusted Certification Authority.

The address bar turns from white to green, indicating to visitors the web site is using Extended Validation SSL.

The web site owner's legally incorporated company name is displayed prominently on the address bar real estate. Extended Validation SSL is the only way for a company to get it's name displayed in the browser address bar.

https://www.globalsign.com/ GMO GlobalSign Inc [...

The standard HTTP is changed to HTTPS, automatically telling the browser that the connection between the server and browser must be secured using SSL.

The padlock is activated, showing you that the browser connection to the server is now secure. If there is no padlock or the padlock shows a broken symbol, the page does not use SSL.

Figure 22. Components of a web-bar with an SSL certificate

Another significant decision made during the planning process was the back-end functionality. For the purpose of the research, the system needed to be able to log usernames, email addresses, login activity dates, completion of health assessment with point values, and reward points earned. A majority of the budget was dedicated to make sure the back-end functionality was equipped to handle the data component for the study.

The system's interface or the front-end of the web-portal was designed to be appealing to the eye and interactive. However, since a majority of the budget was dedicated to the back-end functionality, interface functionality was carefully selected. A main component for the interface was featured enhancements. These featured enhancements included the embedding of video, articles in the form of PDFs, and interactive activities. Using a generic template, the developer was able to create and brand an interface that was cost effective and functional.

Having a practical domain name was another discussion point during the planning phase. Once the parameters of the web portal were analyzed, researchsimplified.com was purchased as the domain name. With a domain name secured, a logo was created to complement the branding of the user interface.

Once all the aspects of the three-tier system were discussed, production of the web portal began. During the production, communication between the researcher and the developer was maintained on almost a daily basis. With a practical timeline for completion in place milestones were established and met. The result was the completion of the system in a six-month period.

Once the system was complete, the system was tested and retested for "bugs." "Bugs" are gaps or inconsistencies in the system. To determine if "bugs" existed, the developer, the assistant developer, and the researcher interacted with the system to verify all components were functioning correctly. When a "bug" was found, it was reported to the developer, the issue was

reviewed, and the correction was made. Once the system was tested it was time to deliver the product to the pilot study recipients.

Pilot Study Results

Table 3 provides feedback from the participants regarding the pilot study. Feedback was provided upon the conclusion of the pilot study when participants were asked to respond to six questions. These questions asked about the activities that were most beneficial, motivation to complete the study, activities of interest, changes to be made, personal changes, and effectiveness of articles. All responses were reviewed and feedback was taken into consideration for further development of the web portal.

Twenty individuals were available to participate in the 30-day review of the Web-portal. Of the 20 individuals available only 7 individuals completed the 30-day review. During the pilot study, a list of problems, concerns, and malfunctions were accumulated. Tasks that inhibited the use of the website were addressed. Other tasks of less concern were revised upon the conclusion of the pilot study.

A major concern was the operating system of the participant. Participants reported that they system worked on one computer, but not another. While trouble shooting the problem, It was determined that the Web-portal did not function properly on Windows XP. To resolve the issue a message was placed on the registration page indicating what systems and search engines work best with the Web-portal.

Results of the pilot study also indicated the articles were easy to read and meaningful. One participant indicated, "The articles about eating competence gave so much information that I was not aware of…" Another participant indicated, "I like the shorter articles. Easier to retain the

info provided. Too much information at once doesn't appeal to a lot of people." The insight about the articles allowed for meaningful and purposeful changes to be made.

To further understand attrition rates the pilot study gave insight into what motivates a participant. Some participants were motivated by the variety of content in the Web-portal and others were motivated by a general interest to see what the Web-portal had to offer. Feedback of this nature was helpful in determining what revisions were necessary and which revisions needed further clarification.

For example, the "tip of the day" remained the same. The pilot study indicated that this was an interesting functionality. A component that changed were the directions to activities and the registration process. Directions were reworded and tutorial videos were added to help a participant register and navigate the web-portal.

Table 3

Pilot Study Responses to Summative Questions (n=7)

Summative Questions	Responses to Summative Questions According to Each Participant (n=7)					
1. **Thinking back over the last 30-day which of these activities did you find most beneficial to gaining eating competence?**	The articles were the most beneficial because they could be printed and kept as a resource for future reference.	Tips of the day. They were short and to the point.	I am not very educated about nutrition so I enjoyed the nutritional education tips.	Just being a part of the survey made me think about food and what I was eating. The tips, even if they were something I was aware of, were helpful reminders of things I should be thinking about when eating.	Couldn't get into "Give it a try"?	The articles about eating competence gave so much information that I was not aware of and made it simple to find it all on this web page.	Since most of what was covered are the things that I already do, I was looking for any new suggestions.
2. **Being as specific and detailed as possible, what kept you motivated to complete the study?**	It was interesting to learn about good nutrition and healthy eating habits.	I was curious as to what information was on the sight.	I would say general health - I am getting older and find that what I eat and how much I eat makes a HUGE difference on how I feel and my weight so I feel a greater need to control what I eat.	Your daily emails.	Said I was going to do it and I honor my commitments.	The motivation for me was that I was learning so much from the recipes and the competence of eating articles that I wanted to know more. The point system kept me coming back too.	I am always looking for new ideas for eating and living healthier. Wish I had more time at work to see more of the study.
3. **What activities did you find most interesting in the study? Why?**	The videos were interesting.	I enjoyed the recipes and how the videos actually showed how the recipe was made. Tips of the day were interesting. They were short and to the point.	Again I would say the nutritional information - there were a lot of common sense tips that I had not really thought about before.	I apologize, but I did not complete many of the activities.	All about the same. Didn't like the constant reference to Wegmans. Have nothing agains Wegmans, shop there all the time. Great Store.	The recipes were most interesting to me. I found the video of the chef preparing and the list of ingredients attached made it easy to follow.	I liked the video presentations.
4. **What changes would you make to strengthen a Web-based eating**	Perhaps more interactive activities could be included,	Some of the reading material was too long. Most people are	The only recommendation I have would perhaps after	Maybe a way to interact with others that are participating...perhaps	Need to change the wording on the question under question	The instructions for the activities that you could do were not so	For a person who needs to change their lifestyle, the program is a

Summative Questions	Responses to Summative Questions According to Each Participant (n=7)						
competence program?	which would gage participants' understanding.	very busy and won't take the time to read something that looks too long.	reading an article you have a screen where it would recap the article in short form so that I could print it - unfortunately as I get older it gets harder to remember everything and this would make for a good refresher.	a final get together for everyone...somewhere to meet and talk about it and share experiences.	"Satisfy your appetite", choice range went from Simple to Challenging? Questions with always & never in my opinion should be changed. Almost impossible to say one (is always), or (has never) done something and be totally honest.	clear. I did not complete any of those. I think clearer instructions would help	good starting point. But I regularly visit 3 similar sites daily, I am at a different point in my lifestyle. Need to have new products and exciting ideas to keep me going back to a site. It can get boring very fast.
5. **What has changed about your eating competence now that the study has concluded?**	Even though I often think about nutrition before choosing my meals, I sometimes neglect to ensure I'm getting a well-rounded diet.	Not too much. I like to eat healthy and I try to always eat a balanced meal.	I know more about food and the effect that foods have on my body. I know a little more about portion control and general nutrition.	I do think about healthy eating more than I used to.	Nothing really	My knowledge has improved regarding my eating habits and helped me to move forward in healthy living.	Sorry, nothing. I wish I had more time at work to continue with the site, but your Wegmans program is very basic. Wegmans emails me seasonal ideas and coupons with it, that I will look at all the time. Short and sweet helps alot. With specific searches available.
6. **Reflecting on the articles you read on this site, were you able to understand the material in the article? Indicate what was good about the articles and please provide feedback on what you would change**	The articles were well written and informative.	I like the shorter articles. Easier to retain the info provided. Too much information at once doesn't appeal to a lot of people.	I found the articles very interesting and informative. For instance what whole grains were good for you versus which ones were not.	gain, I neglected to read all of the articles, so I am reluctant to comment on them. Perhaps I will go back and read more of them, as I feel a bit guilty that I was not a good participant.	Articles were good. At times I felt like I was watching to many ads for Wegmans. Besides that, I need to use Wegmans eggs as and ingredient	The articles were very easy to read and to the point where it was pleasurable to read and continue to go to more articles to read. I wouldn't change the	yes, I was able to understand the materials. Thank you for allowing me to be part of your study.

Summative Questions	Responses to Summative Questions According to Each Participant (n=7)						
about the articles.					in one of their recipes. (just one example)	format of those.	

Internal Review

Upon the completion of the pilot study, the primary researcher, the committee chair, and

the software developer completed a formative evaluation. At the end of the pilot study,

participants (n=7) were asked to provide their feedback through a six-item summative

questionnaire. Responses to the summative questionnaire (table 4) were reviewed and provided

a formative evaluation. Review of the formative evaluation took place via phone conversations,

emails, and face-to-face meetings. Outcomes of the evaluation indicated additional directions

were needed, items in the appraisal inventory were to be adjusted, a base template was added so

the system is compatible with desktop, laptop, and tablet devices and various components of the

user interface benefited from being updated or revised. To make the participant's experience

more desirable and engaging the above recommendations were implemented.

Once the participant registered to participate in the study, the system advanced the

participant to the primary landing page. At this point, the formative evaluation indicated there

was minimal direction to engage the participant. To ensure the participant was clear on his/her

expectations additional directions were provided. Revised directions were provided for both the

experimental group and the control group. To access the directions, the participant clicked on the

question mark icon .

On the primary landing page the following direction was inserted in the question mark

icon :

> Eating competence is an individual's attitude towards food, food acceptance for a
> variety of foods, regulating food to support a stable body weight, and managing
> food context and meals. Click on a section of the wheel to interact with videos,
> articles, and activities. As you complete activities, you will be rewarded with
> points. The more points you have, the better the chance to win the grand prize!

Since directions were consolidated in the question mark icon, the current direction,

"Click on a section to begin!" was left untouched.

Figure 23. Revised landing page

Secondary pages, which provide supporting content for each section of the content wheel,

also incurred revisions for directions. The following direction was added and was available in the

question mark icon:

> Click on a section or slide the bar to view titles and/or advance the carousel.
> When a section of interest appears, click on the section to view the content. Once
> the activity is completed, the red boarder will change to a green boarder indicating
> you have completed the task.

A formative evaluation of the "Goals" page indicated clarity of the directions was a

concern. On this page, the following directions were placed in the question mark icon:

> "Directions: From the 14 goals listed, select three (3) goals you would like to accomplish in the next 30-days. At any time, feel free to change your goals. Please note, after the 20th day you will not be able to change your goals. Good Luck!"

Figure 25. Revised "goals" page

An internal review and feedback from the pilot study participants indicated the 13 social

desirability items from the Crowne and Marlowe Social Desirability Scale were viewed

inpersonable. In addition, switching between an ordinal scale and dichotomous choices was not

desirable. In an effort to remedy the flow of the appraisal inventory, the ordinal scale items and

the dichotomous "true and false" items were placed in separate sections.

To provide additional engagement and interaction with the system the user interface was updated. Instead of the white background, the system had a black background, adding contrast to the page being viewed. In addition, the logo for the Town of Pittsford was added to brand and tailor the system to the target population.

A significant change to the user interface was the addition of the content wheel. By adding the content wheel and deleting the four static entries into the portal, the participant was actively engaged and provided with the opportunity to interact with the system. When a participant clicked on a section of the content wheel, that section was activated and repositioned at the top of the content wheel. An additional click took the participant into that section of the system.

The introduction of the content wheel provided a natural adjustment to display the reward points. Since the center of the content wheel was unused, the points earned were placed in the center of the wheel. Now the points that participant had earned were centrally located on the page instead of at the top of the page. Whenever the participant navigated back to the primary landing page or logs-in to the system, the points refreshed and update accordingly.

To ensure clarity while using the system, pop-up icons were encoded into the content wheel. When the participant mouse over each section of the content wheel the pop-up appeared and provided a description of what each section had to offer. Below is a list of the titles for each section and the description that appeared with a mouse over. In the pilot study version, the pop-up description for "Eat What You Need" and "Balanced Eating Plan" were incorrect. These pop-up descriptions were corrected for the research study.

a. Understanding Eating
(Attitudes and views towards foods)
b. Give It A Try
(Food acceptance for a variety of foods)
c. Eat What You Need
(Regulating food to support a stable body weight)
d. A Balanced Eating Plan
(Manage food choices and meals)

In the original version of the system, an email confirmation was to be sent to the

participant's email when an account was created. Functionality for the email confirmation was

not operational. Attempts to correct the functionality in the system would have postponed the

start date of the pilot study. It was decided by the primary researcher and the software developer

to correct this issue once the pilot study was completed. Once functionality was working

properly, an email was received by the participant once registration was completed. The email

provided the participant with a message welcoming her/him to the study and login information.

With this functionality in place, the participant had a record of his/her login information to refer

to if it was not remembered. The functionality also allowed the participant to retrieve a forgotten

password and username.

Peer Review

To ensure the content for the pilot study and the research study was valid a team of three

nutritional professionals reviewed the material posted on the site. Individuals that were either

registered dieticians or have a Ph.D. with an expertise in nutrition conducted the reviews. Two of

the three reviewers were experienced with the ecSatter model and the accompanying constructs.

Table 4 provides an overview of the conclusions gathered from the peer review process.

Content that was agreed upon by two of the three reviewers remained. If two of the three

reviewers disagree with the proposed content it was removed. Content that had mixed reviews was deferred to the primary researcher on a decision whether to keep or discard the content.

Based on the peer review, there were four modifications or deleted material. One change took place in the "Understanding Eating" and "A Balanced Eating Plan" sections and two changes took place in the "Eat What You Need" section. In the "Understanding Eating" section, the title of an action activity was changed from "Shopping Habits" to "Don't Go Shopping When Hungry." In the "Balanced Eating Plan" section, spelling errors were noted and then corrected in the action activity, "Did You Get What You Thought You Were Getting." The "Eat What You Need" section had two pieces of content removed. Ill-advised recommendations were given in the article, "Five Types of Hunger", therefore, the article was removed. Questions of validity arose with the action activity, "Body Image: It's a Point of View." Specifically, the activity does not address reinforcement or behavioral capabilities. Due to these concerns the action activity was removed. According to the peer review, no changes were recommended and therefore no changes were made to the "Give it a Try" section where participants are encouraged to accept new food to add variety to his/her diet.

Table 4

Peer Review Content Validity Conclusions

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
Understanding Eating (attitudes about eating and the enjoyment of food)	Changing Eating Habits	Article	idle	x			x		I like the article however it is a bit long and I'm wondering if the average person would read through it unless they were really ready to make changes.	x		
	Glass Half Full Mentality	Article	idle	x			x		Good points made here; helps people understand their behaviors	x		
	Five Vegetarian Nutrients	Video	Observational Learning		x	video is informative but only a different format from an article; for observational learning, participants need to observe someone else performing the behavior you want them to adopt	x			x		Good.
	Getting Whole Grains	Video	Observational Learning		x	video is informative but only a different format from an article; for observational learning, participants need to observe someone else performing the	x		I do not agree with presenting this video to individuals who are trying to change their eating habits. Focusing too much on one specific nutrient or idea can confuse people. Clients would be better served by helping them	x		Accurate. Good that she discusses to start slowly.

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	**Subsections**	**Form of Content**	**Proposed Related SCT Construct to Develop Self-Efficacy**	**Y e s**	**N o**	**Comments**	**Y e s**	**N o**	**Comments**	**Y e s**	**N o**	**Comments**
						behavior you want them to adopt			understand the importance of reading ingredient labels. This will be a vital tool in determining whether a food item is a good choice instead of just focusing on one nutrient. The ingredient label shown in this video includes sugar and corn starch which probably aren't the best choices. I also have concerns about telling people that eating whole grain muffins are a good choice for grains as they are high in fat and sugar. (If the goal is observational learning, I agree, but I do not agree with using this video, even for the average client.)			
	Natural vs. Organic	Video	Observational Learning		x	video is informative but only a different format from an article; for observational learning, participants need to observe someone else performing the behavior you want them to adopt		x	Great points! I like the take away message about "understand what you're really buying".		x	Good

	Content Validity Review Categories			Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	**Subsections**	**Form of Content**	**Proposed Related SCT Construct to Develop Self-Efficacy**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**
	Half-Plate Healthy	Video	Observational Learning	x		this video may be closer to obs learning because we see her fill a plate	x			x		Good but wish they wouldn't use pizza
	Shopping Habits	Action Activity	Behavioral Capability, Reinforcement	x			x		Helps clients pay attention to what they are purchasing and why. "eat before shopping" could be changed to "Don't go shopping when hungry". Also what may be helpful is talking about planning meals for the week prior to grocery shopping.	x		Short. That is good. Could be reinforcing good habits.
	Eating Attitudes	Article	idle	x			x			x		I see it is idle. This needs to be much more reader friendly. Since it is a pdf…. It should be easy to change. It is good information but there are some great pamphlets highlighting these points that are very reader friendly!
	Go, Slow, or Whoa	Action Activity	Behavioral Capability, Reinforcement		x	reinforcement is addressed in this activity	x			x		Why is it a shopping item and then you ask what you ate? *Good to see a diet history and to make people think about the foods. I think that chart of foods have some issues. I also think that explaining to people why some foods are go slow or whoa would be educational and it isn't there.

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
												*I think that this is reinforces IF there has been previous education about the foods. Not sure if the education part is there (see above). It increases awareness of foods consumed. I was a bit confused by the categories for the go, slow, and whoa foods. What criteria were used to place these foods in these categories? It seemed to me that it was mainly based on fat content. I would have placed olive oil in the go section as the current advice is not so much avoid all fat, but to consume the right types of fats. I would much rather advise people to eat real olive oil than fat-free chemical laden dressings! Also, sports drinks could arguably be placed in the whoa category as they are equivalent to soda unless one has been exercising for > 1hour and needs some electrolytes. Why would diet ice tea be in a go category? Once again this is a chemical laden drink.

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
Give It A Try (accepting new food to add variety to your diet)	Vegetables with Savory Sauce	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability		x	some obs learning, maybe even behavioral capability, but I don't think it addresses reinforcement	x		Recipe videos are easy to watch and follow.	x		I did not watch all the videos… because of time. I did look at the recipes. I like this section a lot because: 1. Focus on vegetables. 2. Shows how to obtain a variety of food that some may not know how to do. 3. Videos are professionally shot. 4. People can refer to again and again if they don't get it the first time so it can build behavioral capability.
	Veggie Soup in 15	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Roasted Acorn Squash	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Honey Roasted Root Vegetables	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Jambalaya	Video, recipe,	Observational Learning,	X			x			x		

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
	with Rice	feedback	Reinforcement, Behavioral Capability									
	Chicken Parmesan	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Sesame Chicken	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Beef Minestrone	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Lo Mein Salad	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Jamaican Jerk Chicken	Video, recipe, feedback	Observational Learning, Reinforcement, Behavioral Capability	x			x			x		
	Enjoy a Greater Variety of	Article	idle	x			x			x		Needs to be formatted to be reader friendly

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	**Subsections**	**Form of Content**	**Proposed Related SCT Construct to Develop Self-Efficacy**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**
	Food											
Eat What You Need (being able to eat the right amount of food)	Weight Loss Program	Article	idle	x			x				x	OVERALL…. COULD THIS BE FRAMED AS NOT WEIGHT LOSS SECTION…. BUT HEALTHY WEIGHT? BECAUSE OF THE OBSESSION WITH DIETING, A PSYCHOLOGICALLY BETTER APPROACH WOULD BE "KEEPING A HEALTHY WEIGHT" RATHER THAN WEIGHT LOSS.
	Eat Right	Article	idle	x			x			x		
	Healthy Eating -- Eating the Right Amount	Video	Observational Learning		x	no observation of behavior	x		Video is okay for observational learning; explaining food labels. This could be a little confusing when they talk about "60g of carbohydrates/day". The average person may not know how to figure out 60g of carbs, therefore tuning out the rest of the video.	x		Earnest but good.
	Overweight Health Risk	Article	idle	x			x			x		
	Am I	Video	Observational		x		x			x		

	Content Validity Review Categories			Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
	Hungary		Learning									
	Enjoy Your Food While Eating Less	Video	Observational Learning	x			x			x		Good
	Satiety Tricks: Nuts	Video	Observational Learning	x			x			x		Of course this is accurate. It is a bit dull but I wouldn't delete it.
	Portion Control 101	Video	Observational Learning	x			x			x		Good. accurate
	Eat When Hungry	Article	idle	x			x			x		
	Five Types of Hunger	Article	idle	x		I question the credibility of this article, I have never heard of these 5 types of hunger and suggesting a 12 hr fast and liquids till noon don't sound reasonable.	x		The article is ok up to the point addressing "Body Hunger". It is a bit in depth for the average client. I also do NOT agree with the last paragraph advising to avoid solid foods for 12 hours and having only liquid foods before noon. The recommendations of fruit juices, ovaltine and buttermilk may not be good liquid choices as well.		x	Good that this is idle. I think it should be taken out as the ending has advice of which there is no research evidence. This is not necessary to the topic. It also starts with obesity. This is a turn off to the general public. I would advice removing this paper.
	Top 10 Tips for Eating Out Right	Video	Observational Learning		x		x		Video provides good eating out guidelines for the average person.	x		Good topic. Sensible tips.

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	Subsections	Form of Content	Proposed Related SCT Construct to Develop Self-Efficacy	Yes	No	Comments	Yes	No	Comments	Yes	No	Comments
	Body Image: It's a Point of View	Action activity	Behavioral Capability, Reinforcement		x	not sure that this addresses behav cap., might provide some info on critical viewing of media then ask about how they perform the skill; does not address reinforcement	x		May be helpful to better explain what is meant by "visual images". This term may not be clear to all clients.		x	How does this increase behavioral capability or reinforcement. Maybe I am not understanding the terms, but it seems that this is increasing awareness of the media and how people view themselves, but does not reinforce educational principles of teaching people to have a good body image—nor increase their capability of having a good body image.
	2010 Dietary Guidelines	Article	idle	x			x			x		
	Healthy Eating	Article	idle	x			x		Good tips for the average person. Tip about eating whole grains, specifically "unhealthy carbohydrates" lists avoiding refined sugars which would be another benefit in explaining about reading ingredient labels.	x		
	Your Life Span	Article	idle	x			x			x		
A Balanced Eating Plan (being able to	Five Dieting Myths	Video	Observational Learning		x	not observing a behavior; also she only addresses 3 myths vs 5	x			x		good

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	**Subsections**	**Form of Content**	**Proposed Related SCT Construct to Develop Self-Efficacy**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**	**Yes**	**No**	**Comments**
manage food through proper planning, storing, preparing, and offering)	Gluten Free With Ease	Video	Observational Learning		x	no behavior observed; not sure why you've chosen to include gluten free when no other health conditions are addressed. I would consider removing this topic	x		This is helpful with gluten sensitivities.	x		good
	Feeding and Eating	Article	idle	x			x			x		
	A Healthy Snack	Video	Observational Learning				x			x		good
	Eating on a Budget	Article	idle	x			x			x		
	Smart Shopping	Article	idle	x			x			x		
	Plan, Purchase, Prepare	Article	idle	x			x			x		
	Sample Menus	Article	idle	x			x		This is a good initial guideline for the client who is trying to make changes.	x		
	Controlling Portion Size	Article	idle	x			x		The average client/consumer may have a basic grasp of the concepts presented in this section.	x		

Content Validity Review Categories				Peer Review #1			Peer Review #2			Peer Review #3		
Web portal Sections	**Subsections**	**Form of Content**	**Proposed Related SCT Construct to Develop Self-Efficacy**	**Y e s**	**N o**	**Comments**	**Y e s**	**N o**	**Comments**	**Y e s**	**N o**	**Comments**
	Managing Your Feeding and Eating	Article	idle	x			x			x		
	Did you get what you thought you were getting	Action activity	Behavioral Capability, Reinforcement	x		having them look at receipt might help them to assess their skill but is pretty vague; reinforcement may be addressed with the last question but might be a little weak	x			x		Should correct spelling and typos.

Nutritious.

I like this activity because it is short and sweet.

It really shows them what they are doing at the point of purchase. |
| | Be Good to Yourself | Action activity | Behavioral Capability, Reinforcement | x | | I think you are actually measuring self-control or regulation with this activity but might work for capability | x | | Great activity; it is very specific in the goal and when it will be done. People making life changes need this. | x | | This is a good concept. I like the activity but it is cumbersome to do. I would have made this just a weekly exercise as it would be more manageable.

Possibly try to put all the list on one screen page. I would never take the time to scroll around….

Maybe make it a shorter list????? |
| | | | | | | | | | | | | |

Qualitative Analysis

Of the 48 participants who contributed to the study, 11 participants completed the 30-day study. The attrition rate for the paarticipants (n=48) was 67.65% (Table 5), which was moderately high rate for a web-based study (Eysenbach, 2005). The low response rate confirmed the inability to acquire statistical significance, indicating the need for a qualitative analysis to filter out themes and better understand the reason for the attrition rates. Completion of the 30-day study was confirmed by submitting a health assessment prior to starting the study and again when 30-days had passed.

Table 5

Descriptive Data

Descriptive Data	Total
Sample size (n)	48
Age (mean)	44.6
Gender	36 female 12 male
Race	46 Caucasian 2 Prefer not to answer
Ethnicity	47 Not Hispanic or Latino/Latina 1 Prefer not to answer
Completed health assessment prior to 30-day study	34
Completed health assessment after 30-day study	11
Attrition rate	67.65%

To expose the human part of the phenomenon (Jacob & Furgerson, 2012), the researcher complemented the study with an instrumental case study approach. According to Creswell

(2007), an instrumental case study is when the researcher focuses on a specific issue. The specific issue for this study is attrition rates. Being that there was a small sample population, collecting qualitative data provided a better understanding of the phenomenon. (Neutens & Rubinson, 2002). Qualitative data can provide ground zero insight to a complex issue that needs to be further understood (Creswell, 2007). To better understand compliance and attrition rates, the interview process took place. Semi-structured questions regarding the use of the portal provided the researcher with a deeper and richer understanding of the interface and functionalities to promote a sustained behavioral change.

Semi-structured questions were the foundation for the six interviews that took place amongst three groups. Interviews were recorded using QuickTime Player version 10.2 on a MacBook Pro, OS X, version 10.8.5. When the interview was complete, the file was exported and saved as either an audio file or a movie file. Each file was saved on the internal drive of the MacBook Pro, an external drive, and a remote server. Each interview group had a separate interviewing guide, but all three groups had the same overarching question, "What is your idea of a Web-based eating competence program that will assist you in making a sustained behavioral change?"

The first group interviewed were participants who completed the pretest and the posttest. Three individuals were interviewed. Two of the participants were males and the other a female. The female had been following a plant-based diet for over 20 years, one of the males is a type one diabetic, and the other male does not have any restriction on his diet. Each interview took place in an environment that was comfortable and ideal for recording. Once the *Consent for A/V Taping* was reviewed and signed, the interview began. The length of each interview is as follows: the interview with the male who is a type one diabetic lasted18 minutes and 14 seconds;

the interview with the male that has no restrictions was 10 minutes 1second; and the interview with the female following a plant-based diet was 6 minutes 21 seconds.

Each interview followed the guide for participants that finished the study. While interviewing each individual various concepts were discussed. With the male who is a type one diabetic, the discussion focused on food management for an individual with a chronic disease. The interview with the male that has no restrictions was a general discussion about the portal and how the general population will respond to the eating competence web portal. When interviewing the female who follows a plant-based diet, the extended discussion was about recipes, articles, videos, and action activities that are linked to a plant-based diet.

In the second group of interviews, two participants who registered but did not complete the study were interviewed and the same protocol was followed but a different interview guide was employed. The interview guide was designed for a participant that did not complete the study. Both participants were females and single moms. Along with being a single mom, one of the females is also a vegetarian. The other female single mom has no restrictions on her diet. An attribution that resulted from the interviews is the need for functionality that supports a busy lifestyle. The interview with the single mom that has no eating restrictions lasted 5 minutes and 10 seconds and the interview with the single mom that is a vegetarian lasted 5 minutes and 5 seconds.

Once these interviews were complete, the software developer was interviewed. The interview guide for the software developer was designed to extract information about the necessary functionalities available to promote a sustained behavioral change using a web portal. His interview lasted 5 minutes 41 seconds. Interviewing the software developer provided a

technological perspective and helped to reduce misconceptions and provide a greater insight on the functionalities needed to decrease attrition rates.

Having all interviews completed, it was time to transcribe the interviews. The protocol for transcription was as follows: (1) locate the audio or movie file (2) open the file in iTunes (audio) or QuickTime Player (movie) (3) listen to the interview, and (4) create a transcript of the conversation in a Microsoft Word document. MacBook Pro is equipped with a dictation and speech application. There was an attempt to use the dictation and speech application to assist in the transcription of the interviews. On paper the concept was ideal and worked, but the accuracy of the transcription was limited. There was too much editing that needed to take place. Instead, the researcher decided to play portions of the recording, transcribe, review the transcription for accuracy, and then continue with the next portion of the interview.

When the transcriptions were complete, coding began. Since it is important to keep the attributes of each transcript organized, the researcher adopted a method from Saldana (2009). In a Word document, the researcher used the landscape orientation and created three columns using the *Tables* function from the Microsoft Word toolbar. Column one was titled *Data* and contained the content from the transcribed interview. Since the transcribed content from the interview was in the *Data* column, it was the widest column and encompassed 2/3 of the width of the page. Column two was titled *Preliminary*. This is where jotting of the datum's took place for the first cycle of coding. The third and final column was titled *Final* and was dedicated to the second cycle of coding. In this column categories, concepts, and themes emerged. Each transcript was coded separately and the next transcription was not coded until the prior transcript was completed (Saldana, 2009).

With all transcripts coded, inductive reasoning continued and the attributes were conceptualized. Table 6 displays all the attributes from each interview regarding the developing phenomenon, which is an attrition rate. Data analysis extracted the major elements of each interview to disclose themes that were significant attributes to the overarching/specific issue of attrition rates in an eating competence web-based portal.

To view the attributes, the table was organized into three sections: *Completed Study, Did Not Complete Study*, and *Software Developer*. Each section is comprised of three subsections: *Participant, Final Concepts*, and *Meaning/Theory*. As the analysis progressed the participants developed an identity. Participants in the *Completed Study* section became known as follows: (1) male, diabetic, and control group; (2) male, no diet restrictions, and control group; and (3) female, plant-based diet, and experimental group. Participants from the *Did Not Complete Study* section became known as follows: (1) female, single mom, no restrictions, and control group; and (2) female, single mom, vegetarian, and experimental group. The third section included one person and he was identified as the software developer.

Through inductive reasoning, the employment of various coding techniques, and coding cycles, the data from each transcript transformed from dialogue, into categories, then themes, and finally into concepts. Table 6 provides a list of all the concepts from all six interviews in the column titled *Final Concepts*. By placing the data in a formatted table, the concepts were further analyzed and transformed into *Meaning/Theory*. The attributes that emerged were these: user friendly interface, error free interface, portal is a resource to manage eating competence, functionality of the portal stimulates a positive and significant behavioral change, and functions properly on a variety of mobile and stationary devices.

Table 6

Emerging Themes from Qualitative Analysis

	Participant	Final Concepts	Meaning/Theory
Completed Study	Male: Diabetic Controlled Group	Sustainability, Commitment, User friendly interface, syncs with lifestyle/adds value, manages a chronic health condition, mobile, notifications, filters content for users needs, promotes significant results with limited effort, appeals to all users	User friendly interface, error free interface, portal is a resource to manage eating competence, functionality of the portal stimulates a positive behavioral change, functions properly on a variety of mobile and stationary devices
	Male: No diet restrictions Controlled Group	Appeals to all learning styles, self-motivating, functional/error free, attractive interface, strategies to build eating competence skills/challenging, memorable/purposeful information	
	Female: Plant-based diet Experimental Group	Functionality that is user friendly and error free, Visually appealing interface, content for a variety of diets, meaningful and purposeful content/activities to change behavior, filters content for users needs, reward oriented	
Did Not Complete Study	Female: Single mom, no diet restrictions Controlled Group	Filters content for users needs, promotes significant results with limited effort, syncs with lifestyle, Goal oriented, user friendly, mobile, accommodates busy schedule	
	Female: single mom, vegetarian Experimental Group	Notifications, needs to promote a change/motivate, appealing interface, accommodate busy schedule, move an individual from contemplation to action	
Software Developer	Software developer	Communicate with target population, videos and notifications promote learning, rewards promote instant gratification, social media concepts are intertwined, outcome is a healthy individual that promotes additional positive outcomes, mobile	

With the Meaning/Theory known, the overarching qualitative research question can be revisited; what is your idea of a Web-based eating competence program that will assist you in making a sustained behavioral change? To best portray attrition rates, a realistic perspective of an individual using the portal was presented. The portrayal modeled and helped conceptualize how the system reduced attrition rates and increase eating competence.

Once the participant has decided the portal has value and will help with her/his eating competence the registration process will begin. The process to register and use the system will be

self explanatory, clear, and concise. A participant will experience a system that guides the participant along from start to finish. Once the registration process is complete the participant can then start using the system to make a sustained behavioral change. When logged in and at the main page of the portal, the user will experience an interface that is appealing and motivates the participant to begin exploring the content. Feeling comfortable with how to navigate the site, the participant will be able to move around the portal with limited buffering and load time of pages. When an interest is not satisfied, the participant can use the *Search* option and access the necessary information being sought. The more the system is used the more comfortable the participant feels using the system.

Continuous encouragement will come from a daily *Tip of the Day*. The *Tip of the Day* provides the participant with a cue to action or a recommendation that will encourage the participant to access the system to work on changing an attitude, plan a meal, try new foods, and eat only what is needed to manage eating habits; all actions to stimulate a positive and significant behavioral change. Another functionality to stimulate a behavioral change are the points received for completing activities and the graph that shows the participants progress and trends. With a system that does what is intended and works error free the participant makes progress towards having stronger eating competence skills and the value of the portal is significant.

To ensure compliance is attained, mobility with the system is available. Logging progress and communicating with the portal through tablets and smart phones further encourages the participant to increase eating competence skills. By being able to maintain communication with the system the portal is in sync with the participant and compliance continues. The end result is a system that becomes a part of the participant's lifestyle and is a continuous resource towards eating competence.

Summary

In this chapter, results of the development and implementation of an eating competence web portal are discussed. The discussion begins with the development of the web portal and the various phases and barriers that were addressed and overcame. Finding a software developer on a limited budget with an interest in eating competence was the first barrier. Once this barrier was overcome a secure web portal with functions that model the constructs of the Social Cognitive Theory to increase eating competence skills was developed. Before testing the web portal in a pilot study with a sample of convenience, the content was peer reviewed for content validity and necessary changes were made. Upon the completion of the pilot study the qualitative components were reviewed and an internal review took place. These reviews indicated areas that needed to be addressed and corrected before the study took place with a randomized sample population.

Confirmation of attrition rates indicated the need for the qualitative study. The results of the study provided outcomes that were significant to the field. It is now known that an eating competence web portal needs to have a user friendly interface, an error free interface, a portal that is a resource to managing eating competence, functionality in the portal to stimulate a positive and significant behavioral change, and a portal that functions properly on a variety of mobile and stationary devices. With having these functionalities present, attrition rates will decrease and the building of eating competence skills will increase.

CHAPTER 5

DISCUSSION

Overview

To expose the human part of the phenomenon (Jacob & Furgerson, 2012), the researcher employed an instrumental case study approach. According to Creswell (2007), an instrumental case study is when the researcher focuses on a specific issue. The specific issue for this study was attrition rates and how the SCT constructs influenced eating competence. To gain a better understanding of the issues, qualitative data was collected. (Neutens & Rubinson, 2002). Qualitative data provided ground zero insight to a complex issue that needed to be further understood (Creswell, 2007).

To extract meaning, an instrumental case study was conducted and three groups of individuals were interviewed about the Web-portal. Interviews included semi-structured questions and provided the researcher with a deeper and richer understanding of the interface and functionalities desired to promote a sustained behavioral change. At the end of each interview the overarching interview question brought all thoughts and perspectives together. As the interviews took place concepts began to surface. Over time and through analysis meaning and theory emerged. These results will drive future research in a direction that make future interventions meaningful and purposeful.

Chapter five discusses the interpretation of results and how the results connect to the literature review; future practice in the field of health education; future research to refine the web portal; and recommendations to make future research more effective, meaningful, and purposeful. The research that took place in this study was a stepping-stone to open our minds and

expand the discipline's horizons on the implementation of a web portal to foster knowledge, attitudes, and behaviors.

Qualitative Research Question

With a better understanding of why high attrition rates exist and a deeper understanding about how constructs from the SCT influence eating competence, the overarching qualitative question can be discussed. What is the ideal Web-based eating competence program that will assist participants in making a sustained behavioral change? To support the overarching qualitative research question the following sub questions provided additional insight: (1) What activities/content in the Web-portal had the most impact? (2) What activities/content in the Web-portal had the most influence? (3) How do participants stay motivated when engaged in a Web-based eating competence program? (4) What type of content is needed in a Web-portal to produce a sustained behavioral change? (5) What makes the Web-portal easy to navigate? (6) What functionality needs to be included in a Web-portal to produce a behavioral change? (7) How can the development of an eating competence Web-portal stay within the budget?

Interpretation of Results (Meaning/Theory)

To keep attrition rates low in web-based interventions, this study contributes five guidelines to the discipline of health education. These guidelines will aid in the design, development, and function of the web portal, resulting in a resource that will assist an individual in managing a health disparity. Below is the list of guidelines to follow with connections to the literature review.

1. **Portal is a resource to manage eating competence**

Providing the participant with knowledge helps to educate the individual on the topic. In this case, the topic is eating competence and information was available regarding eating attitudes, food acceptance, internal regulation, and contextual skills. Participants using the system expressed an interest in having functionality where information can be accessed; much like a search function that is available in a search engine. The web portal developed for this dissertation did not have a "search" function. This is a designated place in the web portal were a participant can input key words, click "search," and information on a topic will be provided on the web page. A recommendation is to have a search function so participants can acquire functional knowledge and practice skills associated with the topic of the intervention.

When referring back to the literature, Crowley (2008) indicated obesity is a global epidemic and finding a means to reduce obesity rates through effective weight management is now a clinical focus. By having a search function, participants could access information and activities that promote weight management and help to reduce obesity (Crowley, 2008). Not only will a "search" function give the participant knowledge about content in the portal, the system can track the participant's progress and award points. In addition, goals can be set and monitored and user ratings of activities will indicate to other web portal participants activities that are meaningful and purposeful.

Further support from the literature indicates a web portal needs to be a resource to manage eating competence. Satter (2007) believed, "Eating is a complex process made up of learned behavior, social expectations, acquired tastes, and attitudes and feelings about eating in general and about certain food items in particular" (p. S142). Being able to manage a variety of foods in adequate amounts to meet the needs and stresses of life is a cumbersome task (Satter, 2007). The complex process of eating can be managed with the web portal. For

example, a participant may be seeking meals that are high in nutriontional value and easy to prepare. This can be accomplished by accessing the recipe section of the portal. Directions, videos, and ingredients are listed for all recipes and designed to be user friendly. Thus, making the complex eating process more manageable.

2. Functionality of the portal stimulates a positive behavioral change

Since the literature on Web-based interventions demonstrated a consistent trend in the use of Bandura's social cognitive theory (SCT) (Bernhardt, 2001; Cook, Billings, Hersch, Back, & Hendrickson, 2007; Oenema, Brug, & Lechner, 2001; Ornes & Ransdell, 2007) it is recommended to continue using the SCT as a framework for development. This dissertation began as a randomized controlled study and the functionality for each group differed. The control group had basic access to the system and functionality was limited to providing the participant with more knowledge. The experimental group was equipped with functionality designed to promote a behavioral change and was supported by the constructs of the SCT. Participants in the experimental group were able to track their progress, received a reward for participation, and set goals.

In an attempt to keep attrition rates high and inspire participants, two rewards were available for the experimental group. For the participant accumulating the most points in 30 days, a $100 gift card to a local supermarket was awarded. The participant with the second highest point total received a $50 gift card to the same supermarket. Not all individuals responded in the way that was expected. With a $100 reward and a $50 reward available the expectation was more participants would be motivated to interact with the web portal. Better understandings of the type of rewards participants are expecting/looking for will be a worthwhile investigation.

A functionality that did motivate individuals was the "tip of the day." The "tip of the day" is a tailored message and is supported in the literature review. Kukafka, Lussier, Eng, Patel, & Cimino (2002) indicated a tailored messages is geared to influence an individual's cognitive process based on educational strategies. On a daily basis, participants were emailed an encouraging fact about eating competence. It is important to note that this tailored message encouraged participants.

The "tip of the day" concept as a tailored message is supported by Glasgow, et al (2007) and Cook, et al (2007). Glasgow, et al (2007) indicated a web-based program could be more cost effective by including specific and relevant messages that are either targeted or tailored. The web-based versus non-web-based study by Cook et al. (2007) was designed to test the efficacy of a multimedia intervention compared to high-quality commercially available print materials on the same topics (but not necessarily the same content) as a control. Indicating a web-based intervention may need to have a combination of tailored and targeted messages to meet the needs of the target audience.

3. User-friendly interface

Being able to have a seamless experience while using the portal is a part of having a user-friendly interface. From the time the participant enters the portal, each click needs to have a purpose and there needs to be flow and clarity in each part of the portal. At times, participants using the eating competence portal were not exactly sure how to navigate the content and had a challenge understanding how all the activities available benefited a participant's eating competence.

The interface or appearance of the intervention on the screen of the computer or mobile device needs to be organized and laid out so the participant can navigate the site. The color scheme of the interface needs to be easy on the eye so the information can be read and

function tabs can be identified. Function tabs that lead the participant to specific information need to be placed strategically on the web page so the participant can access the intended area of the portal. With components of a user-friendly interface missing, it is possible there was a negative impact on the participant's ability to understand how to use the eating competence web portal.

To clarify what the web portal had to offer, a "help" button icon was installed. Even with the installation of a "help" button, which provided video tutorials on how to use the portal, participants still had challenges. Participants either did not view the tutorials, were unaware of what the "help" button icon contained, and/or needed further assistance. In future research, web portals that incorporate an intervention need to have clear and concise directions on how to effectively use the web portal and have a design lay out that is organized and appealing to the participant.

4. Error free interface

A significant amount of time was dedicated to making sure all aspects of the web portal were working correctly. When the interface is activated through a username and password, all aspects of the portal need to be functioning properly. During the instrumental case study, participants indicated that some of the activities did not function the proper way. Whenever a portion of a site is not working, participants get frustrated and leave that area. The reason for the error could be a "bug" in the code, the operating system of the device being used, or the participant is creating the error.

One function of the portal that was vital and error free was the "wellness wheel" on the landing page. The "wellness wheel" was made up of four categories and each category held various information and activities related to the ecSatter framework. In addition, the web

portal had a goals section, a rewards section, and a health assessment section. Each of these functions needed to be error free and work together. If the HTML code were not written properly the system would indicate an error message. Sometimes these error messages are an easy fix, other times fixing the error message indicated the code had to be rewritten. Spending time testing the portal and being diligent with the testing will eliminate error and result in lower attrition rates.

5. Web portal functions on a variety of mobile and stationary devices.

Budgetary constraints prevented the eating competence web portal from being developed into an application that could be viewed on mobile devices. However, when mobility of the web portal emerged as a meaning/theory there was reassurance that having a web portal available on mobile and stationary devices needs to be explored and developed. The challenge will be having a system available on a variety of devices with technology that is always changing and advancing. It will take a software developer that is well versed in the dimensions of health and the rapid advancement of technology and available functionality.

Recommendations for Future Practice

When technology is an integral part of society, the potential for a valid, reliable, and sustainable web portal exist. In the discipline of health education our profession looks to standards, frameworks, best practices, and evidence-based research to indicate what the target population needs and how to best deliver an intervention. From these resources and tools, the intent is to foster behavior changes that lead to a healthy life style. Through the implementation of an interactive Web-portal, there is the potential to reach a greater number of people and meaningful interventions can be delivered.

Currently, health interventions are conducted in the workplace (Quintiliani, Sattelmair, & Sorensen, 2007), community settings (Merzel & D'Afflitti, 2003), health care facilities (The Health Educaiton Specialist: A Study Guide for Professional Competence, 2007), and schools (Kann, Brener, & Allensworth, 2001). With the versatility of the Web-portal's platform, as the platform develops, dissemination into the various settings will be ideal for the goals of this platform and the intervention. Linnan, et al. (2008) indicated quality health promotion programs implementing innovative and purposeful technology to accommodate diverse settings and environments remains an important public health goal. By compressing all dimensions of health into one Web-portal, participants have a "one stop shop" to manage their health and wellness. This "one stop shop" or comprehensive health and wellness web portal will streamline with the expectations of the population using the platform and the evolving technology world.

For this reason, continued development of a Web-portal designed to address health as a whole and in singular dimensions should take place. As development takes place the five guidelines that emerged from this study should be considered. Development needs to include a user-friendly interface, an error free interface, a search function to increase functional knowledge, functionality to stimulate a positive behavioral change, and the ability to operate on a variety of devices and platforms. If these components are not addressed and planned for, attrition rates will be affected.

The natural progression for this eating competence Web-portal is to transition to a comprehensive approach where physical activity, prevention, social interaction, and stress management channels are available along with nutrition. The literature review indicates an individual's wellness is composed of physical, intellectual, interpersonal, spiritual, environmental, and emotional dimensions (Insel & Roth, 2008). These six dimensions are

interrelated and facilitate an individual's optimal health or wellness (Insel & Roth, 2008). To

accommodate for these dimensions and a comprehensive approach, each section of the wheel

located on the landing page of the portal can be expanded from four sections to five sections

(Figure 5). When the participant clicks on the desired section of the wheel, a cover flow will

appear providing activities associated with the selected topic. As the participant navigates the

portal, the system will record the activities completed, award points for participating, provide the

option to store biometrics, set and monitor goals, and present challenges to engage other

participants.
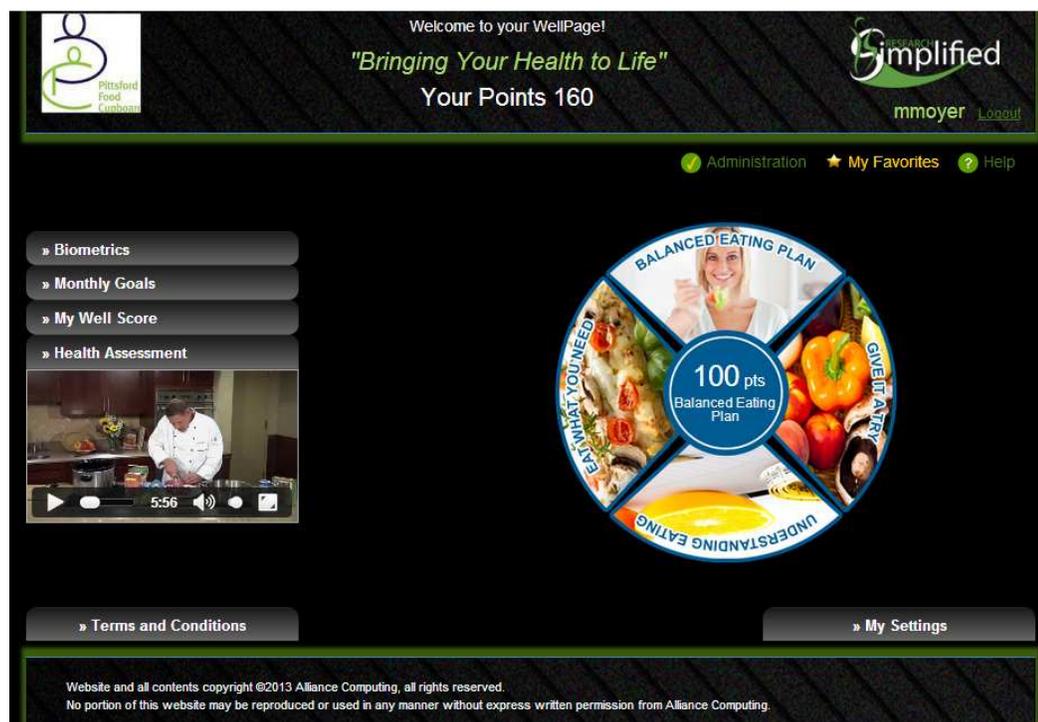
Figure 5. Landing page design

Software Development and Budget

Successful development of a web portal is pending on the skills of the software developer

and the relationship established with the developer. During the scope of this dissertation two

software developers were used. The first developer began production of the web portal in a code called flash. Flash contained functionality that was interactive and engaging, but was limited in options to promote best practices. Fortunately, due to financial challenges, this developer was no longer able to provide services.

The second developer was a better fit for the project. With a broader understanding of health and knowing a behavior change takes place when the functionality matches best practices, HTML code was introduced. Having the eating competence portal grounded in HTML enabled the developer to customize code and match the best practices outlined for health education.

Budgeting to produce and/or refining a web portal are essential. The budget for the Web-portal in this study was $7,000.00. Since the software developer had an interest in the study he matched the researcher budget so the necessary functionality could be developed. With numerous options available, having a specific and itemized budget kept expenses down and the project on point. If the developer has the project's best interest in mind a conservative but essential scope of work will be developed. Before production takes place the health educator should fully understand the process involved to create a web portal. Ask questions and be meticulous at knowing what is taking place during each phase of production. As development takes place the developer will establish milestones to demonstrate the progress that has taken place. As development progresses, there will be setbacks, this is normal. A professional software developer will communicate these setbacks in a timely fashion. Budget accordingly in anticipation for setbacks, they will happen and there will be a cost.

When development is completed, it will be time to peer review and pilot test. A recommendation is to have the content peer reviewed before launching. By doing so, clarity of the web portal will be addressed and the experience for the pilot study population will be more

meaningful. The peer review for this dissertation indicated a body image activity should be eliminated and several videos should be removed. Eliminating an activity or other content that was thought to have relevance can be a challenge to accept. However, it is the peer review process that recognizes the content insufficient for the target population. When developing a web portal, understand there will be content and activities paid for during development that may not be included when the web portal is launched.

During pilot testing anticipate issues to arise. Issues could come from several different directions and under various circumstances. It is a good idea to make sure the web portal works on several operating systems and with various Internet connections. Be prepared to communicate with the pilot study group. The information being provided is valuable to the success of the project and achieving the goals of the intervention.

Recommendations for Future Research

The magnitude of this topic provides several opportunities for future research. Of the highest priority is the quantitative piece. Since the attrition of participants was a challenge, power and statistical significance was not achieved. There is a need to test the efficacy of web-portals with regards to affecting change in the SCT constructs, eating competence, and actual behavior change.

A recommendation is for quantitative testing to take place. In order for the testing to be meaningful, sufficient participants need to be recruited. Recruitment may be a challenge since an individual's time is valuable and setting time aside in an already full schedule is a barrier. Even with gift cards as rewards in the sum of $100 and $50, attainment of participants is not guaranteed. Instead of a randomized controlled trial a sample of convenience may be an initial set.

If a randomized controlled trial with a control group and an experimental group were to take place for the population identified in this study, the sample population available is 22,612 residents 18 years and older. (About Pittsford; State and County QuickFacts, 2011). To attain power at .80, 104 plus participants, a minimum of 52 participants in each group, would need to complete the intervention (Faul, Erdfelder, Lang, Buchner, 2007).

In a randomized controlled trial, the culd study utilized the ecSI questionnaire as a pretest and posttest measure to determine the difference in change between the experimental group and the control group. A randomized control trial calls for a pretest before the intervention and a posttest after the intervention to verify if the intervention has had an impact on the behavior (Issac, 1995). A random method would place each participant in a group so statistical tests could be conducted allowing differential effects between the experimental group and the control group to be compared for statistical significance (Issac, 1995). The experimental group and the control group would be the same except the experimental group would be exposed to an intervention (Dimitrov & Rumrill, 2003).

The dependent variable for the study will be a change in eating competence. The independent variables for the study will be the control group and the experimental group. Independent variables for the study will align with SCT constructs that are conducive to techniques that work well using a Web-based platform. Statistical analysis for this study will be descriptive statistics, inferential statistics, t-test, correlations, and ANCOVA. Power for the study will be calculated to determine a sample size that will provide statistical significance. The results of the quantitative study will provide guidance to future development of the web portal.   A second recommendation is to address how a web portal can influence a change in attitudes. In health promotion an interest exists to further understand how behaviors are changed through

attitudes (Dignan, 1995). The web portal discussed in this dissertation has the potential to be an instrument that creates a behavior change and impacts a participant's attitude. Exploring functionality a web portal needs to change attitudes is an area where research can be conducted. Continuing with the SCT as the theoretical framework, a web portal's affect on changing attitude can take place. A construct to explore is outcome expectancies. Outcome expectancies are referred to by Bandura as incentives or values placed on an outcome (Bandura, 1977; Bandura, 1986 as cited in, Baranowski, Perry, & and Parcel, 2002). A charge is to determine how attitudes in a web portal change based on incentives.

A third recommendation is to verify the impact of another behavioral model or theoretical framework as a foundation for the web-portal. When reviewing the constructs of the Health Belief Model (HBM) each of the six concepts could have an impact on attrition rates in a web-portal, specifically the perceived susceptibility construct. If the web-portal can accurately assess an individual's perception of a health risk, the web portal may have more value to the individual (Institute, 2005). It would be ideal to create knowledge on the functionality needed in a web portal to assess an individual's perception of a health risk.

A fourth recommendation is to create knowledge on how a comprehensive health and wellness web-portal impacts various demographics. Glanz et al. (1998) refers to studies by Kristal et al. (1995) and Glanz et al. (1994) indicating demographics have a varying impact on an individual's taste, nutrition, cost, convenience, and weight control to individual persons. Gaining knowledge on how a web portal can promote healthy food choices can also impact an individual's weight control (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). By understanding various demographics a web portal can be more significant.

Summary

Chapter five discussed recommendations for future research and best practices, an interpretation of the results, the impact of a positive relationship with the software developer, and the importance of a budget to develop an intervention with a web portal. The recommendations indicate there is the potential for further development of a web portal to become comprehensive and incorporate the dimensions of health and wellness. To complement the development of a comprehensive web portal consideration should be given to the five guidelines that emerged from the instrumental case study. As a comprehensive web portal is further developed, statistical tests should be conducted to verify the significance of the web portal and the impact the web portal will have on behavior change. Lastly, the design, development, and implementation of a web portal involve a budget that is specific and allows for variations in design to take place. A software developer well versed in design and development and who has a connection to health and wellness, builds a relationship with the researcher, and impacts the final product.

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APPENDICES

Appendix A: *Screen Shots*
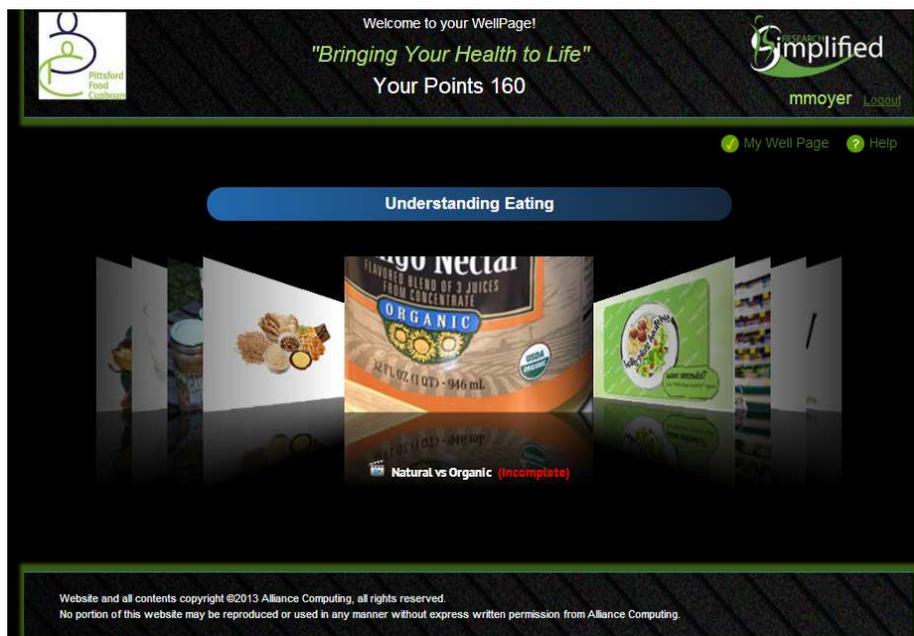
Figure 6. Example of content in the understanding eating section
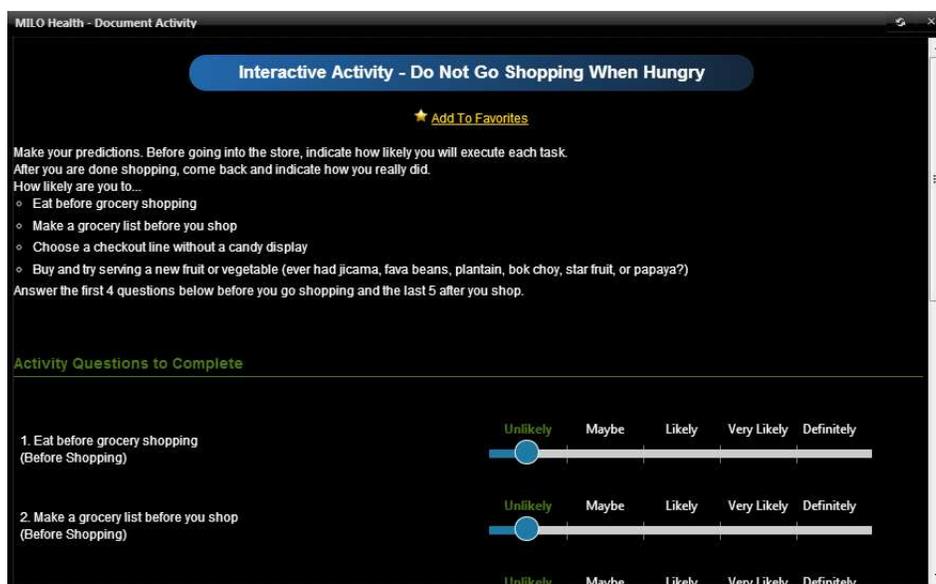
Figure 7. Interactive activity: "Do not go shopping when hungry"
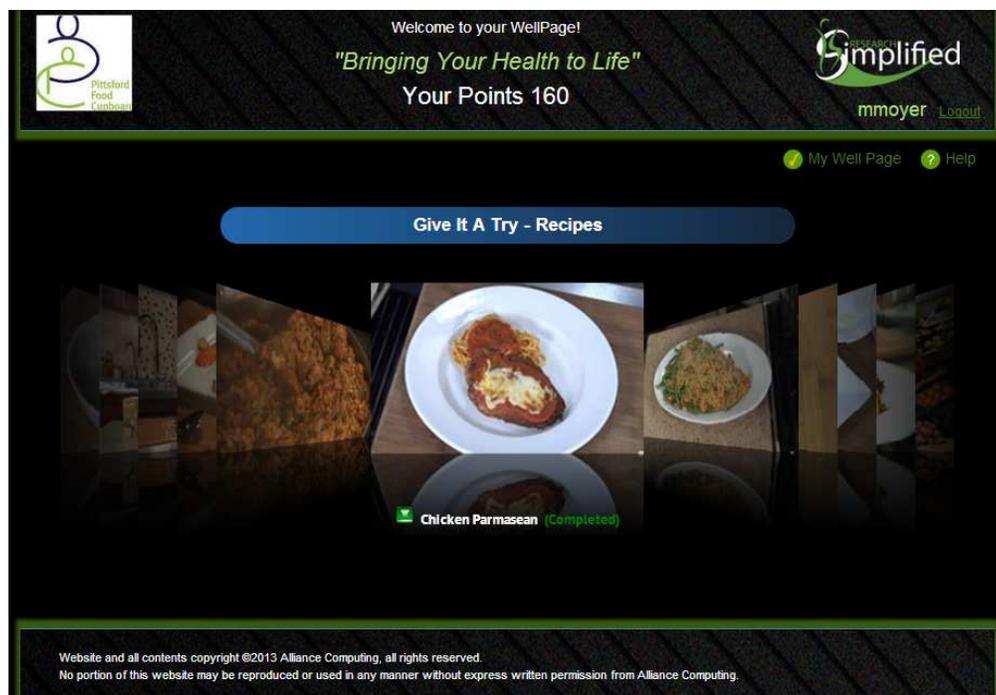
Figure 8. Give it a try section layout

Figure 9. Example of content in the give it a try section

Figure 10. Subsections for the eat what you need section

Figure 13. Five dieting myths

Figure 24. Revised secondary page

Appendix B: *Application for ecSatter Inventory*

Application for ecSatter Inventory (ecSI)

and/or the ecSatter Inventory Low Income (ecSI/LI)

As stated in the usage protocol, permission to use ecSI or ecSI/LI is reserved for validation studies or for testing of a clearly defined clinical or educational intervention. Please provide a succinct project description following the guidelines below and *using the form on the next page*. Be specific about timing of testing and delivery protocol (e.g., paper, web). Please limit the description to 600 words. Please email you completed application to corres@ellynsatter.com and *ecSI Application* in your subject line.

ecSI Use	Project Description Guidelines
Research	• What is the research question? • What population will be studied? • What is the role of the ecSI or ecSI/LI in this study? • What is the planned sample size and power analysis? • What strategies will be used to recruit subjects? • What instruments or measures will be included in addition to ecSI or ecSI/LI? (Include any psychometric, nutritional, physical, metabolic, and psychological tests.)
Clinical Intervention*	• Describe the clinical problem (e.g. weight management, Type 1 or Type II diabetes, specific eating disorder, weight gain during pregnancy). • Explain your clinical intervention. *Be concrete*, i.e. what do you mean by non-dieting, trust model, intuitive eating, healthy eating, food plans, etc. • Do you plan to increase or reduce intake of certain nutrients, e.g., energy, carbohydrate, fat, etc. By what means? • Describe social unit addressed, e.g. individual, family, group • Indicate client ages
Educational Intervention*	• What is the educational setting (e.g. WIC, Head Start, university, extension, primary health care)? • What is the target audience (e.g., professionals or other staff, participants, students)? • Indicate ages of the target audience. • What is the course or program title? • Explain the scope and focus of the curriculum. Be concrete, i.e. what do you mean by non-dieting, healthy eating, food plans, nutrient focus, etc. • Indicate that you will NOT be teaching ecSI as part of the course content, i.e. teaching to the test.
Human Subjects Review	• What are your plans for human subjects review? What agency will you approach for this review?

*The distinction between clinical and educational intervention is made on the basis of assessment and treatment planning. The clinical intervention includes individualized assessment and treatment planning. The educational intervention does not.

ecSI or ecSI/LI Project Description

Date of application: September 9, 2011

Project Director	Company/Affiliation	Complete Address	Email/Phone
Matthew T. Moyer, MA, CHES	Southern Illinois University, Carbondale	29 Greylock Ridge Pittsford, NY 14534	moyer@siu.edu 585-355-9412
Project/Program/Course Title (check Project Type below)			
The Use of an Interactive Web-based Platform, founded on Construct from the Social Cognitive Theory, to Amend Food Consumption			
Research x	**Clinical**	**Education**	
Organization through which you will apply for human subjects review			
Southern Illinois University, Carbondale Human Subjects Committee			
Project Description			

As a nation with an obesity epidemic and an enjoyment for interactive technology, researching a method to amend food consumption with interactive technology, theoretically, seems to be a good fit. Which leads to the following research question: "**Using an interactive web-based platform, is there statistical significance in an intervention, supported by the constructs of the social cognitive theory, to amend food consumption?"**

To address the stated task, a target population of 22,612 residents 18 years and older in a township located in Monroe County, New York will be solicited for the study. With the approval of the town supervisor and the town wellness coordinator, participants will be solicited at town events, an advertisement in the monthly newsletters, flyers in town businesses, and a posting on the town's website. In addition, enticing incentives will be offered to encourage participation.

Participants of the study will be divided into two groups, a control group and an experimental group. Employing the ecSatter attitudes and behaviors as guidelines, participants in the control group will only receive content-based information. Content-based information is defined as articles, videos, and other media sources that provide only information. Information will be on such topics as how to shop effectively, the difference between organic and traditional food, foods that are low in sugar versus foods that are high in sugar, and information on how to plan a healthy menu. What will be omitted is the action and skill-building component; this will be part of the experimental group design.

For the experimental group, a myriad of interactive activities based on the constructs of the social cognitive theory will be provided. Again, employing ecSatter attitudes and behaviors as guidelines, participants will be able to plan and establish a goal for the duration of the intervention, track their progress, and receive rewards and incentives for meeting benchmarks. For example, through the planning process, a participant may set a monthly goal stating; within the next 30-days, 85% of the food and beverage purchases will be low in sugar. To meet this goal, the participant will need to complete a module that is designed to provide the cognitive skills as well as the behavioral skills. In a hierarchical format, the participant will first be provided with cognitive information, then there will be a video(s) demonstrating how to be an effective grocery shopper, finally the individual will create a low sugar shopping list and actually go to the store to purchase the food and beverages. During this process, the individual will be receiving points, cues to action, and social support. Intertwining several constructs in a comprehensive plan will result in a positive rewarding experience. Content validity for both groups will be assessed prior to launching the intervention.

To measure the impact of the intervention, all participants will take the ecSI as a pretest and after 30-days of the intervention, the participants will take the ecSI as a posttest. Mean scores will be analyzed using descriptive and inferential statistics, specifically ANOVA testing. To obtain effect size the mean ecSatter Inventory score for group 1 (31.1 ± 7.5) came from the research article, *Measuring Eating Competence: Psychometric Properties and Validity of the esSatter Inventory*. For group 2, the mean esSatter Inventory score (26.29 ± 9.7) came from the research article, *Validation of a Measure of the Satter Eating Competence Model with Low-Income Females*. Inputting these parameters into the G*Power 3.1.3 software package, the effect size is .554. With an effect size of .554, an alpha of .05, and power of .8 the sample size of a two-tailed test is 104 people.

Appendix C: *ecSatter Inventory (ecSI) items with Crowne and Marlow Social Desirability(CM) Short Form C items (to be renamed Appraisal Inventory)*

(ecSI) or (CM)	Item	Response Choice
ecSI	I am relaxed about eating.	Always, often, sometimes, rarely, never
ecSI	I am comfortable about eating enough.	Always, often, sometimes, rarely, never
CM	It is sometimes hard for me to go on with my work if I am not encouraged.	True or false
CM	I sometimes feel resentful when I do not get my way	True or false
ecSI	I enjoy food and eating.	Always, often, sometimes, rarely, never
ecSI	I am comfortable with my enjoyment of food and eating.	Always, often, sometimes, rarely, never
ecSI	I feel it is okay to eat food I like.	Always, often, sometimes, rarely, never
CM	On a few occasions, I have given up doing something because I thought too little of my ability.	True or false
ecSI	I experiment with new food and learn to like it.	Always, often, sometimes, rarely, never
ecSI	If the situation demands, I can "make do" by eating food I don't much care for.	Always, often, sometimes, rarely, never
ecSI	I eat a wide variety of food	Always, often, sometimes, rarely, never
CM	I am sometimes irritated by people who ask favors of me.	True or false
ecSI	I assume I will get enough to eat	Always, often, sometimes, rarely, never
CM	No matter who I am talking to, I am always a good listener.	True or false
ecSI	I eat as much as I am hungry for.	Always, often, sometimes, rarely, never
CM	There have been occassions when I took advantage of someone.	True or False
ecSI	I eat until I am satisfied	Always, often, sometimes, rarely, never
CM	I'm always willing to admit it when I make a mistake	True or False
CM	I sometimes try to get even rather than to forgive and forget.	True or False
ecSI	I tune into food and pay attention myself when I eat.	Always, often, sometimes, rarely, never
CM	I am always courteous, even to people who are disagreeable.	True or False
ecSI	I make time to eat.	Always, often, sometimes, rarely, never
CM	I have never been irked when people expressed ideas very different from my own.	True or False
ecSI	I have regular meals.	Always, often, sometimes, rarely, never
CM	There have been times when I was quite jealous of the good fortune of others.	True or False
ecSI	I think about nutrition when I choose what to eat.	Always, often, sometimes, rarely, never
CM	I have never deliberately said something that hurt someone's feelings	True or false
ecSI	I generally plan for feeding myself. I don't just grab food when I am hungry.	Always, often, sometimes, rarely, never
CM	There have been times I felt like rebelling against people in authority even though I knew they were right.	True or False

Summative questions

1. Thinking back over the last 30-day which of these activities did you find most beneficial to gaining eating competence?

2. Being as specific and detailed as possible, what kept you motivated to complete the study?

3. What activities did you find most interesting in the study? Why?

4. What changes would you make to strengthen a Web-based eating competence program?

5. What has changed about your eating competence now that the study has concluded?

6. Reflecting on the articles you read on this site, were you able to understand the material in the article? Indicate what was good about the articles and please provide feedback on what you would change about the articles.

Appendix D: *Introduction to the Study: Consent Script*

(Will be converted to an on-line, read only form)

Eating Competence Consent Form

November 2012

My name is Matt Moyer. I am a doctoral candidate in the Department of Health Education and Recreation at Southern Illinois University-Carbondale. I am asking you to participate in my research study. The purpose of my study is to see how eating behaviors change using a Web-based program. Eating competence is ones attitude towards food, food acceptance for a variety of foods, regulating food to support a stable body weight, and managing food context and meals.

To be eligible for the study, you will have to meet three criterions, (1) You must be 18 years of age and a resident of the Town of Pittsford, NY, (2) Have access to the Internet and/or a technological device where you can interact with the website, and (3) Have an interest in obtaining eating competence.

Participation is voluntary and will be for 30 days. When you have set-up an account with a username and password, you will have also given consent to participate in the 30 day study. The first time you login, you will be asked to answer some questions about your current eating habits. Once the questions are completed, you will be directed to a website that will have content to assist in gaining food competence. After 30 days, you will be asked to complete a second set of questions about your eating habits. Once you have completed these questions you will have finished the study.

Emails providing a "Tip of the Day" will be sent out on a daily basis. Emails will also be sent out to participants that are inactive in the study. Each e-mail will provide an option to opt out of the study. Participants inactive in the study may receive anywhere from 0-5 e-mails asking for your participation in the study.

Your participation in the study will benefit the Pittsford Food Cupboard. For every individual that registers for the study, one dollar will be donated to the Pittsford Food Cupboard. An additional dollar will be donated for each individual that completes the study. The donation amount will be capped at $350. You must participate for a minimum of four different days with in the first seven days, and complete at least three activities on the site during each login session.

All your responses will be kept confidential within reasonable limits. Only those directly involved with this project will have access to the data. We will take all responsible steps to protect your identity. If you have any questions about the study, please contact me, Matt Moyer, or my advisor, Stephen L. Brown, Ph.D. My phone number is 585-355-9412. Dr. Brown's phone number is 618-453-1863 (office). Thank you for taking the time to assist me in this research.

Best regards,

Matthew T. Moyer, MA, CHES
Doctoral Candidate
Department of Health Education and Recreation
Southern Illinois University-Carbondale

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

Appendix E: *Sign to attract participants*

Appendix F: *Thirty Days of Content including SMOG Readability*

Articles

Channel and Titles of Articles	SMOG
Understanding Eating	
1. Attitudes About Eating Can Make or Break You	10th grade
2. Why a glass-half-full mentality is better for your weight—and your health	12th grade
3. Changing Your Habits: Steps to Better Health	6th grade
4. What are the health risk of being overweight?	7th grade
5. Eat Right	9th grade
Give It A Try	
1. Enjoy a Greater Variety of Food	9th grade
Eat What You Need	
1. Eat As Much As You Are Hungry For	9th grade
2. Eat Right	9th grade
3. What are the health risks of being overweight?	7th grade
4. Choosing a Safe and Successful Weight-loss Program	8th grade
5. Five Types of Hunger	7th grade
A Balanced Eating Plan	
1. Managing Your Feeding and Eating	9th grade
2. Healthy Eating Across Your Lifespan	6th grade
3. 2010 Dietary Guidelines: A Blueprint for Health	9th grade
4. Controlling Portion Sizes	7th/8th grade
5. Healthy Eating: Easy Tips for Planning a Healthy Diet and Sticking To It	10th grade

Articles for the **Understanding Eating** channel (attitudes about eating and the enjoyment of food)

Attitudes About Eating Can Make or Break You

SMOG: 10th grade

January 16, 2008 • Family Meals Focus #22 • Eating competence: Eating attitudes

January 16, 2008
Family Meals Focus #22
Interpreting the news and research about feeding and eating

FMF #21 introduced the concept of the Satter Eating Competence Model (ecSatter). This newsletter and the next three address each of the four components of ecSatter: eating attitudes, food acceptance, internal regulation and management of the food context. A fifth newsletter in this ecSatter series puts it all together. The information is excerpted from *Secrets of Feeding a Healthy Family*.

Your attitudes about eating can make or break you. Unlike what we *think* (our conscious judgment) attitudes are based on feelings and beliefs, both often unexamined. Attitudes are generally subtle and implied rather than spoken right out loud, and are, in fact, often hard to pin down. But they affect you nonetheless. They control your behavior, influence the way you feel, and dictate your priorities.

Competent eaters have positive attitudes about eating and therefore are relaxed about it. They enjoy food and eating and they are *comfortable* with their enjoyment. They feel it is okay to eat food they like in amounts they find satisfying. In contrast to these perfectly normal and highly desirable attitudes about eating, most people today feel more or less ambivalent and anxious about eating and doubt their ability to do a good job with food management. They carry around standards of what and how much they *should* eat, often ill-defined,and feel ashamed of themselves when they like,and eat,food that falls short of their standards.[1]

We become neurotic when we don't trust our feelings and inclinations, and as a result we don't feel comfortable acting on them. As a matter of fact, we suffer from a *national* neurosis about eating. Surveys find that we try not to eat the foods we enjoy in amounts that we find satisfying and instead feel obligated to eat "nutritious food" in amounts that leave us hungry,or at least unsatisfied.[2] In the last 20 years, the percentage of people who acknowledged enjoying eating decreased from 48% to 39%.[3] Eating "enjoyably" comes loaded with guilt and fear; eating "properly" comes loaded with control and dreariness. Many times we careen from one to the other, like the respondents to a 2005 *Parade* magazine survey who say they eat a healthy mix of foods, then reward themselves with "pleasure foods."[4]

ecSatter research findings show evidence that competent eaters do better with feeding themselves and have positive health indicators.[5] None of that surprised me. What did surprise me, although it shouldn't have, is that competent eaters are emotionally and socially healthier than people with low levels of eating competence. They feel more effective, they are more self-aware, and they are more trusting and comfortable with themselves and with other people.[6]

Allow the psychotherapist in me to explain these findings. Consider that being emotionally and socially healthy,emotionally competent, if you will, depends on being sensitive to and comfortable with what goes on inside you,knowing what you feel, what you want, who you *are*,and being honest with yourself and with others about it. Your comfort and honesty with yourself allow you to act on your feelings in a rational and productive way. You can appreciate not only your own feelings and wishes but those of other people and, as a consequence, be reasonably adept at working things out.

Being competent with eating depends on exactly the same processes: being sensitive to and comfortable with what goes on inside you and being honest with yourself and others about it. In this case, of course, we are talking about your enjoyment of good food, your drive to get enough to eat, your excitement about eating,all of the natural and even laudable feelings and urges that surround your eating. We are also talking about the sensations that regulate your eating,your hunger, appetite, and satiety. Your comfort and honesty with yourself about your inner experience related to your eating allow you to be matter-of-fact about responding to that inner experience and manage your eating in a rational and productive way.

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Why a glass-half-full mentality is better for your weight—and your health

SMOG: 12th grade

Each day, without being aware of it, you see a glass as being half full or half empty with respect to nutrition. Do you emphasize the positives, such as striving to eat a more nutritious diet to enrich your health? Or do you focus more on what you shouldn't have—fatty foods, sugary delights, and high-calorie favorites. Why does it even matter? Because research tells us that different eating strategies have distinctive effects on weight and health. Some are good and some are, well … not so good.

A study published in the ***European Journal of Clinical Nutrition*** examined the eating styles of 4,393 healthy individuals. The goal of this study was to investigate little-recognized contributors to the obesity epidemic. And to control for genetic influences, the subjects in the study were Finnish monozygotic twins.

The eating style most closely linked to obesity and poor eating habits was what the researchers called "restrictive overeating." People in this group avoid certain foods such as high-fat items but then also have periods of overindulging. Snacking, grazing at night, and avoiding fatty foods were also associated with excess weight, although the researchers point out that these behaviors stem from restrictive overeating. The eating style most closely tied to a normal weight was "health-conscious" eating. Instead of restricting certain foods from their diets, health-conscious eaters look for ways to include healthy items.

"People who alternate restricting and overeating appear to be more vulnerable to obesity than are individuals who maintain a balanced level of energy intake," says lead researcher Anna Keski-Rahkonen, MD, PhD, an epidemiologist from the department of public health at the University of Helsinki in Finland. "Because maintaining a restrictive diet for long periods is nearly impossible for most people, they eventually compensate by overeating."

Keski-Rahkonen explains that studies like this one point to reasons other than genetics for being overweight. And she adds that when you look at it from an evolutionary standpoint, the study results make sense "because for most of their history humans have had to struggle with the scarcity of food, but in our current food-abundant and inactive environment, our ancient weight control mechanisms turn against us," she says. "A constant imbalance in energy intake and expenditure results in weight gain."

Apparently, the human body—and mind—doesn't respond well to feelings of deprivation. When this happens, food becomes even more a focus, with snacking, grazing at night, and focusing on external cues causing an eventual response to overeat. Looking at eating in a positive light, including more fruits and vegetables, lean meats, and healthy fats, and eating fewer calorie-dense foods, is a much better long-term strategy.

How best to lose weight? Small reductions in food intake may be most effective. Tricking the body is key as major cutbacks appear to set off an alarm of sorts, but minor changes tend to go unnoticed. Plus it gives people the opportunity to make adjustments that are more in tune with their lifestyles and personal preferences. Keski-Rahkonen recommends that individuals "closely match their energy intake with their energy expenditure—choosing healthful foods and engaging in regular physical exercise."

Starting today, make a conscious effort to see nutrition from a glass-half-full perspective that emphasizes all the positives of eating healthy. Don't beat yourself up for having cheesecake; just try to eat less of it. And if you have weight to lose, avoid extreme measures. Instead, get in the habit of leaving some food on your plate. Don't forget to build regular physical activity into your daily routine.

Hopefully, these are changes you can live with—which is why they may just work.

Adopted from the Website: Today's Diet and Nutrition – Positive Nutrition
http://www.tdn-digital.com/article_111510_02.shtml
— *Maryann Tomovich Jacobsen, MS, RD*

Changing Your Habits: Steps to Better Health

SMOG: 6th grade

Do you want to eat healthier or become more active?

Most Americans have tried to eat healthier or be more physically active at some point in their lives. Why, then, do many of us eat high-fat and high-calorie foods and have such a hard time fitting in exercise? You may be wondering: is it even possible to change your habits?

The answer is *yes!* Change is always possible, and a person is never too out-of-shape, overweight, or old to make healthy changes.

This fact sheet offers strategies to help you improve your eating and physical activity habits. Whether you feel like change is a world away or just around the corner, the information here can help you get started.

One Step at a Time

Change is always possible, and a person is never too out-of-shape, overweight, or old to make healthy changes.

Old habits die hard. If you want to change your habits, you may find it helpful to make realistic and gradual changes one step at a time and at your own pace. It is important to think about what motivates *you,* what trips *you* up, and what *you* enjoy when it comes to eating and activity habits. There is no such thing as a "one-size-fits-all" approach.

The first step in developing your personal plan for change is to figure out where you stand. Many people who are interested in becoming more active or eating healthier foods fall into one of four "stages" of change. Read on to identify the stage that applies to you now.

Find your Stage of Change.

"It has crossed my mind."
The contemplation stage of change is the time when people are thinking about change and trying to become more motivated to get started.

You might be in this stage if:

- You have been considering change but you are not ready to start.
- You believe that your health, energy level, or overall well-being will improve if you develop new habits.
- You need to find some extra help to get going.
- You are not sure how you will overcome the roadblocks that stand in the way of success.

"I have made up my mind."
Preparation is the stage of change when people become planners and figure out specific ideas that will work for them.

You might be in this stage if:

- You have decided that you are going to change and you are ready to take action.
- You have set some specific goals that you would like to meet.
- You have thought about ways that can help you reach your goals.
- You are getting ready to put your plan into action and get started soon.

"I am going for it."
In the action stage, people are acting on their plan and making the changes they set out to achieve.

You might be in this stage if:

- You have been making eating or physical activity changes in the last 6 months or so.
- You are adjusting to how it feels to eat differently or be more active.
- You have been "trouble-shooting" to overcome things that have gotten in the way of your success.
- You are thinking about more ways you can keep up, or add to, the changes you have already made.

"I am in the groove."
The maintenance stage is when you have become used to your change and have kept it up for more than 6 months.

You might be in the maintenance stage if:

- Your change has become a habit. This means you are being physically active on most days of the week or making healthful food choices regularly.
- You have found creative ways to keep going and stick with your routine.
- You have had slip-ups and setbacks but have been able to get past these snags.
- Your healthy habits are a positive example for your friends, family, coworkers, or others.

Learn strategies for change.

Did you find your stage of change? If so, take a look at these stages again, this time with an eye on strategies you can use to get past your roadblocks and move on to the next stage.

The Contemplation Stage ("It has crossed my mind.")

It can be hard to make the leap from thinking about change to taking action. It might be helpful to ask yourself about the pros (benefits) and cons (drawbacks) of changing your habits. It can be easier to move ahead when your pros outweigh your cons. Look at the lists below. Check off statements that you believe are true for you.

Healthy Food Choices…

Pros

- Help me feel energetic.
- Improve my health.
- Lower my risk for health problems.
- Help me lose weight.
- Help me maintain a healthy weight.
- Make me feel proud of myself.
- Are fun to explore.
- Set an example for friends and family.
- Taste delicious.
- _____
- _____
- _____

Cons

- Are too expensive.
- Do not taste good.
- Mean giving up foods I love.
- Make me stand out in my family or workplace.
- Are confusing to make.
- Are difficult to shop for.
- Are not usually available to me.
- Take too much self-control.
- Are not important.
- _____
- _____
- _____

If your pros outweigh your cons, you might be ready to move on to the preparation stage. During this stage, you closely explore your barriers and think of ways to overcome them.

However, it is okay if you have more cons than pros. Remember that it is best to move at your own pace. Begin thinking of ways to get past your drawbacks. Your solutions do not need to be perfect, but you need to believe that there *are* ways to overcome your barriers, no matter how difficult they may seem.

Think about how the benefits of physical activity or healthy eating might relate to your personal life. For example, suppose your blood pressure is a bit high and you have a parent, sister, or brother who has heart disease. This means you are at risk of developing heart disease too. You may find that it is easier to work out and eat healthy knowing that it may help you live a life free of heart disease. In this way your efforts may mean more to you.

You can learn more about the positive outcomes of changing your eating and activity habits from your health care provider. You may find that knowing more about the benefits of physical activity and healthy eating may help you begin to take action.

The Preparation Stage ("I have made up my mind.")

If you are in the preparation stage, you are about to take action. This does not mean taking big steps. Rather, it means creating your plan for action and beginning to make small changes.

To get started, look at the list of pros and cons above. Which pros or cons were true for you? How can you move past your drawbacks and emphasize the benefits?

Also, consider these common ways to prepare yourself:

- Make time.
- Ask friends and family for support.
- Develop a plan.
- Set small goals and rewards.

When you start making changes, track your progress through a physical activity log or healthy eating journal. This can help you identify your strengths, spot areas where you can improve, and stay on course. You need to record not only what you did, but how you felt while doing it—your feelings can play a role in our habits.

The chart below lists barriers and solutions common to many people as they begin changing their habits. Think about these things as you make your plan. You can keep using these tips when you actually do spring into action.

Solutions to a Barrier

"I don't have time!"

Make your new healthy habit a priority. Whenever you can, fit in physical activity. Try taking the stairs or getting off the bus a stop early. Set aside one grocery shopping day a week, and make healthy meals that you can freeze and eat later when you do not have a lot of time to cook.

"It costs too much."

Start a walking group! Walk around the mall during off-peak hours, find a school track, or go to a local park. Eat healthfully on a budget by buying in bulk and opting for frozen or canned fruits and vegetables. See the WIN publications listed at the end of this fact sheet for more ideas.

"I can't make this change alone."

Recruit others to be active with you. That will help you stay interested and be safe. Also, consider signing up for a fun exercise class, like salsa dancing. Get your family or coworkers on the healthy eating bandwagon. Plan healthy meals together with your family, or start a healthy pot-luck once a week at work.

"I don't like physical activity."

Forget the old notion that being physically active means playing football or lifting weights in a gym. You can be active in many ways, including dancing, walking, ice skating, gardening, or taking fun fitness classes. The list goes on and on! Explore options you never thought about, and stick with what you enjoy.

"I don't like healthy foods."

Rather than suddenly switching to new foods, find out how you can make your favorite foods in a healthy way. For example, you can trim fat from meats, use applesauce when you bake, and reduce the amount of butter, sugar, and salt you cook with. For more information, see the Additional Resources section of this fact sheet.

"I don't know enough about it."

Talk to your doctor, a fitness professional, or a registered dietitian to learn more. You do not have to be an expert to change your habits. A few tips and ideas can do wonders!

"I'm not motivated."

Think about your biggest reasons for being healthy. For example, do you want to be there for your family, be able to do the things you love without feeling tired or out of breath, or reduce your health risks? Think about these things when you want to quit. Also, try mixing things up to stay interested.

The Action Stage ("I am going for it.")

To stick with your habits, it is helpful to assess how you are doing, overcome your setbacks, and reward yourself for your hard work and commitment.

You are making real changes to your lifestyle, which is fantastic. To stick with your habits, it is helpful to assess how you are doing, overcome your setbacks, and reward yourself for your hard work and commitment.

Track your progress.

- Review your plan and keep an activity journal or food diary to track your progress. Writing down your progress can be one of your most important tools for staying on a healthy path. It serves as a

good reminder, helps to keep you focused, and will help you catch slip-ups. Keeping a journal is a great way to measure how close you are to reaching your goals.

Overcome your barriers.

- Problem-solve to "outsmart" your barriers. In addition to those discussed above, WIN's publications *Tips to Help You Get Active* and *Just Enough for You: About Food Portions* offer tips for overcoming barriers. Remember to ask a friend or family member for help when you need it and always try to plan ahead. For example, if you know that you will not have time to be physically active after work, go walking with a coworker at lunch or start your day with an exercise video. If you tend to snack mindlessly while the television is on, prepare a cup of hot tea to sip instead.

Reward yourself!

- Set rewards to stay motivated. Ideas include new workout gear, a hot bath, a new hobby, or a new book. While you should be proud of your progress, keep in mind that a high-calorie treat or a day off from your exercise routine are not the best rewards. If negative thoughts creep in, remind yourself how much good you are doing for your health by eating healthier and getting more physical activity.

The Maintenance Stage ("I am in the groove.")

Make your future a healthy one. Remember that eating healthfully and being physically active are lifelong behaviors, not one-time events. Always keep an eye on your efforts and make adjustments to deal with the planned and unplanned changes in your life.

Now that healthy eating or physical activity has become a part of your routine, you need to keep things interesting, avoid slip-ups, and find ways to cope with what life throws at you.

Add variety and stay motivated.

- Mix up your routine with new activities, physical activity buddies, foods, recipes, and rewards.

How do I deal with unexpected setbacks?

- Plan ahead to avoid setbacks. For example, find other ways to be active in case of bad weather, injury, or other unusual situations. Think of ways to eat healthfully when traveling or dining out, like packing healthy snacks while on the road, or sharing an entrée with a friend in a restaurant. If you do have a setback, do not give up! Setbacks happen to everyone. Regroup and focus on meeting your goal as soon as you can.

Challenge yourself!

- Revisit your goals and think of ways to expand them. For example, if you are comfortable walking 5 days a week, consider adding strength training twice a week. If you have successfully limited your saturated fat intake, try cutting back on added sugars too.

Articles for **Give It a Try** channel (accepting new food to add variety to your diet)

Enjoy a Greater Variety of Food

SMOG: 9th grade

February 20, 2008 • Family Meals Focus #23 • Eating competence: Food Acceptance

February 20, 2008
Family Meals Focus #23
Interpreting the news and research about feeding and eating

FMF #21 introduced the concept of the Satter Eating Competence Model (ecSatter). This newsletter addresses one of the four components of ecSatter: food acceptance. It is excerpted from the second edition of Secrets of Feeding a Healthy Family.

From the perspective of ecSatter, the key to nutritional excellence is variety growing out of genuine food enjoyment.[1] Food acceptance attitudes and skills that support food enjoyment are more important for you than what you eat on any one day. Being able to be calm and relaxed in the presence of unfamiliar food: to experiment with it; to pick and choose from what's available, and to say yes, please, and no, thank you. ecSatter doesn't tell you what to eat, but instead, encourages you to take an interest in food and to eat foods you enjoy. Our research shows that people who have high overall eating competence scores, and particularly those who have high scores with respect to food acceptance, enjoy a greater variety of food and are more likely to plan and cook meals that include all the food groups.[2]

Enjoy your food. What an alarming notion! Surely, wonder the food cops as well as the eaters, if we are given license to enjoy food we will simply career out of control, willy-nilly gobbling every morsel that

comes across our voracious paths. In conventional nutrition practice, if appetite is addressed at all, it is from the perspective of ignoring and overruling it. We have come to fear that we are bottomless pits,that if we get encouragement to eat foods we enjoy, we will eat without stopping. And if we do that, we are bad-bad-bad!

In reality, appetite works *for* us, rather than *against* us. Appetite is a natural and life-giving inclination. The interest in eating based on its aesthetic and gustatory rewards is a powerful motivator for food-seeking. Even though appetite is compelling, it *can* be satisfied. Being an epicure,valuing and experiencing sensual pleasure,is a critical factor in becoming satisfied. It is normal to get enough and to stop eating, even of highly enjoyable food. If you pay attention when you eat, you will notice that at some point you lose interest. Food stops tasting as good. That might be a sudden or a gradual cutoff for you,it is very individual. As one of my patients put it, "I am ready to stop when my mouth is finished as well as my stomach." Another called this subjective endpoint "a feeling of nuffness." I can't improve on those descriptions. They were both saying that *appetite* is satisfied. But to satisfy appetite, you have to find the food appealing and it has to taste good. Eating a whole package of rice cakes won't satisfy you if what you really want is chocolate chip cookies,or vice versa.

Most of us crave pleasure from eating and will go to some length to achieve it, even if we have to cheat and play little mind games with ourselves. The problem is out-of-control virtue. Guard against it! Nutrition suffers when the rules get the upper hand over enjoyment. If you have to break your rules to eat what you like, you are being too strict and withholding. In the long run, you will come out behind, not ahead.

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Articles for **Eat What You Need** channel (being able to eat the right amount of food)

Eat As Much As You Are Hungry For

SMOG: 9th grade

March 19, 2008 • Family Meals Focus #24 • Eating competence: Internal regulation

March 19, 2008
Family Meals Focus #24
Interpreting the news and research about feeding and eating

FMF #21 introduced the concept of the Satter Eating Competence Model (ecSatter). This newsletter addresses one of the four components of ecSatter: internal regulation. It is excerpted from the second edition of Secrets of Feeding a Healthy Family.

From the perspective of ecSatter, a person with effective food regulation attitudes and behaviors is confident of getting enough to eat and trusts the body's internal signals of hunger, appetite and satiety to guide how much to eat. ecSatter doesn't say how much to eat, but instead, encourages you to eat as much as you are hungry for.[1] Our research shows that people who have high overall eating competence scores, and particularly those who have high scores with respect to food regulation, have lower BMIs, are more physically active, and, most importantly, express greater satisfaction with their weight.[2]

Eat as much as you want? It just gets curiouser and curiouser! Are we to throw caution to the wind and let every meal be Thanksgiving dinner? Won't we just eat ourselves sick? Or at least gain a lot of weight?

The notion that eating as much as we want creates nutritional mayhem leaves out an essential part of the equation: the body's wisdom. Your body knows how much you need to eat. Essential to eating's rich reward is having *enough* to eat. Being hungry and eager to eat can feel positive and exciting on the one hand or negative and distressing on the other. The difference lies in whether or not you are confident that your hunger and appetite will be satisfied, that you can look forward to getting enough to eat of food that you find rewarding. The irony, in this land of plenty, is that most of us fear hunger, not because we lack the financial resources to provide for ourselves, but because we obligate ourselves to under eat. At any one time roughly three-quarters of both men and women are dieting to lose weight or maintain weight loss.[3]

As a result, most of us *are* potential overeaters. However, we don't set out to gorge ourselves. Contrary to the fears of the food cops, both internal and external, we don't have a slothful inclination toward overindulgence. Rather, we overeat because we are *restrained* eaters, we chronically restrict ourselves. We restrict ourselves until we can't stand it anymore, then we overeat.

Setting aside food restriction is like nutritional judo, going *with* the natural drive to eat as much as you want rather than fighting *against* it. After people learn to trust and honor their true and legitimate needs, they find that rather than periodically cutting loose and eating a great deal of high-calorie food, they eat moderately and consistently of all food, all the time, and find it genuinely satisfying. Foods that are no longer forbidden become ordinary foods that can be consumed in ordinary ways. Large portion sizes become less appealing in the context of regular and reliable meals and snacks featuring adequate amounts of rewarding food.

Check yourself. You are being restrained when you feel deprived. You are disinhibiting when you sneak off to eat. The solution? Trust your body to help you find the middle ground between the two extremes. Feed yourself reliably and well, and eat as much as you are hungry for. Your eating will fall into place when you learn to trust yourself, to be reliable about feeding yourself, to accept that taking pleasure in eating is natural, and to acknowledge that eating *enough* is essential.

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Eat Right

SMOG: 9th grade

Staying a healthy weight is about making sure that you and your family keep an energy balance. Energy is another word for "calories." What you eat and drink is ENERGY IN. What you burn through physical activity is ENERGY OUT.

The same amount of ENERGY IN (calories consumed) and ENERGY OUT
(calories burned) over time = weight stays the same

More IN than OUT over time = weight gain
More OUT than IN over time = weight loss

The best way to make sure your energy equation is *balanced* is to make better choices *before* you or your family even picks up that fork—or tips that glass to your lips—by making sure to:

- Choose foods that are lower in fat and have fewer calories
- Learn to read the nutrition facts labels on packaged foods, and identifying other, more nutritious foods.
- Review dietary guidance
- Check out the *Dietary Guidelines for Americans*. Published every five years by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture, these guidelines can help you build good dietary habits that can reduce your risk of major chronic diseases.
- Explore some sample eating plans. These plans—the USDA Food Guide and the DASH Eating Plan—help you figure out how much of each food group (e.g., fruits, vegetables, grains, meats) you need to be eating each day.
- Cook smart
- Read about some easy substitutions that can help you make great recipes healthier by using lower fat or lower calorie ingredients—they'll be better for you but will still taste great.
- Eat smaller portions
- Consider that in many cases, the amount of food that appears on your plate in a restaurant has nearly doubled over the past 20 years. And that's affected the way we look at and serve food at home, too. Learn more about what we call "portion distortion," and about the difference between a portion and a serving.
- Make better choices when you eat out
- Be careful when eating out, too, just eat smaller portions and try to identify items on the menu that are lower in fat and calories. And don't forget you can always ask for a healthier substitution.
- Know your calories
- Remember that whether they come from a soda, sweet potato, or a steak, they're still calories. And calories count.

What are the health risks of being overweight?

SMOG: 7th grade

Extra weight may put you at higher risk for:

- type 2 diabetes (high blood sugar)
- high blood pressure
- coronary heart disease and stroke
- some types of cancer
- sleep apnea (when breathing stops for short periods during sleep)
- osteoarthritis (wearing away of the joints)
- gallbladder disease
- irregular periods
- problems with pregnancy, such as gestational diabetes (high blood sugar during pregnancy), high blood pressure, or increased risk for cesarean section (c-section)

Why do people become overweight?

Many factors may play a part in why people gain weight.

- Habits. Eating too many calories may become a habit. You may also develop a habit of doing sedentary activities like watching TV instead of being physically active. Over time, these habits can lead to weight gain.
- Genes. Overweight and obesity tend to run in families. Although families often share diet and physical activity habits that can play a role in obesity, their shared genes increase the chance that family members will be overweight.
- Illness. Some diseases may lead to weight gain or obesity. These include hypothyroidism, Cushing's syndrome, and depression. Talk to your health care provider if you think you have a health problem that could be causing you to gain weight.
- Medicine. Some medicines may lead to weight gain. Ask your health care provider or pharmacist about the side effects of any medication you are taking.
- The world around you. You can find food and messages about food at home, at work, at shopping centers, on TV, and at family and social events. People may eat too many foods high in fat, sugar, and salt just because they are always there. On top of that, our modern world—with its remote controls, drive-in banks, and escalators—makes it easy to be physically inactive.
- Emotions. Many people eat when they are bored, sad, angry, or stressed, even when they are not hungry.

Although you may not be able to control all the factors that lead to overweight, you *can*

Be Good to Yourself

Many people feel stress in their daily lives. Stress can cause you to overeat, feel tired, and not want to do anything. Regular physical activity can give you more energy. Try some of these other ideas to help relieve stress and stay on track with your fitness and nutrition goals:

- Get plenty of sleep.
- Practice deep breathing while relaxing your muscles one at a time.
- Take a break and go for a walk.
- Take short stretch breaks throughout the day.
- Try taking a yoga or tai chi class to energize yourself and reduce stress.
- Try a new hobby, like a pottery class or any activity that sparks your interest.

- Surround yourself with people whose company you enjoy.

A balanced eating plan, regular physical activity, and stress relief can help you stay healthy for life.

Tips for Adults

- Eat breakfast every day. People who eat breakfast are less likely to overeat later in the day.
- Choose whole grains more often. Try whole-wheat breads and pastas, oatmeal, brown rice, or bulgur.
- Select a mix of colorful vegetables each day. Vegetables of different colors provide different nutrients.
- Have low-fat, low-sugar snacks on hand at home, at work, or on the go to combat hunger and prevent overeating.
- At restaurants, eat only half your meal and take the rest home.
- Visit museums, the zoo, or an aquarium. You and your family can walk for hours and not realize it.
- Take a walk after dinner instead of watching TV.
- Get plenty of sleep.

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1 WIN Way
Bethesda, MD 20892–3665
Phone: (202) 828–1025
Fax: (202) 828–1028
Toll-free number: 1–877–946–4627
Email: win@info.niddk.nih.gov
Internet: www.win.niddk.nih.gov

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Contact Us

Toll free: 1-877-946-4627 Fax: (202) 828-1028 E-mail: win@info.niddk.nih.gov
Weight-control Information Network, 1 WIN Way, Bethesda, MD 20892-3665

Choosing a Safe and Successful Weight-loss Program

SMOG: 8th grade

Choosing a weight-loss program may be a difficult task. You may not know what to look for in a weight-loss program or what questions to ask. This fact sheet can help you talk to your health care professional about weight loss and get the best information before choosing a program.

Talk With Your Health Care Professional

If your health care provider tells you that you should lose weight and you want to find a weight-loss program to help you, look for one that is based on regular physical activity and an eating plan that is balanced, healthy, and easy to follow.

You may want to talk with your doctor or other health care professional about controlling your weight before you decide on a weight-loss program. Doctors do not always address issues such as healthy eating, physical activity, and weight management during general office visits. It is important for you to start the discussion in order to get the information you need. Even if you feel uncomfortable talking about your weight with your doctor, remember that he or she is there to help you improve your health. Here are some tips:

- Tell your health care professional that you would like to talk about your weight. Share your concerns about any medical conditions you have or medicines you are taking.
- Write down your questions in advance.
- Bring pen and paper to take notes.
- Bring a friend or family member along for support if this will make you feel more comfortable.
- Make sure you understand what your health care provider is saying. Do not be afraid to ask questions if there is something you do not understand.
- Ask for other sources of information like brochures or websites.
- If you want more support, ask for a referral to a registered dietitian, a support group, or a commercial weight-loss program.
- Call your health care professional after your visit if you have more questions or need help.

Ask Questions

Find out as much as you can about your health needs before joining a weight-loss program. Here are some questions you might want to ask your health care professional:

About Your Weight

- Do I need to lose weight? Or should I just avoid gaining more?
- Is my weight affecting my health?
- Could my extra weight be caused by a health problem such as hypothyroidism or by a medicine I am taking? (Hypothyroidism is when your thyroid gland does not produce enough thyroid hormone, a condition that can slow your metabolism—how your body creates and uses energy.)

About Weight Loss

- What should my weight-loss goal be?
- How will losing weight help me?

About Nutrition and Physical Activity

- How should I change my eating habits?
- What kinds of physical activity can I do?
- How much physical activity do I need?

About Treatment

- Should I take weight-loss drugs?
- What about weight-loss surgery?
- What are the risks of weight-loss drugs or surgery?
- Could a weight-loss program help me?

A Responsible and Safe Weight-loss Program

If your health care provider tells you that you should lose weight and you want to find a weight-loss program to help you, look for one that is based on regular physical activity and an eating plan that is balanced, healthy, and easy to follow. Weight-loss programs should encourage healthy behaviors that help you lose weight and that you can stick with every day. Safe and effective weight-loss programs should include:

- Healthy eating plans that reduce calories but do not forbid specific foods or food groups.
- Tips to increase moderate-intensity physical activity.
- Tips on healthy habits that also keep your cultural needs in mind, such as lower-fat versions of your favorite foods.
- Slow and steady weight loss. Depending on your starting weight, experts recommend losing weight at a rate of 1/2 to 2 pounds per week. Weight loss may be faster at the start of a program.
- Medical care if you are planning to lose weight by following a special formula diet, such as a very low-calorie diet (a program that requires careful monitoring from a doctor).
- A plan to keep the weight off after you have lost it.

Get Familiar With the Program

Gather as much information as you can before deciding to join a program. Professionals working for weight-loss programs should be able to answer the questions listed below.

What does the weight-loss program consist of?

- Does the program offer one-on-one counseling or group classes?
- Do you have to follow a specific meal plan or keep food records?
- Do you have to purchase special food, drugs, or supplements?
- If the program requires special foods, can you make changes based on your likes and dislikes and food allergies?
- Does the program help you be more physically active, follow a specific physical activity plan, or provide exercise instruction?
- Does the program teach you to make positive and healthy behavior changes?
- Is the program sensitive to your lifestyle and cultural needs?
- Does the program provide ways to keep the weight off? Will the program provide ways to deal with such issues as what to eat at social or holiday gatherings, changes to work schedules, lack of motivation, and injury or illness?

What are the staff qualifications?

- Who supervises the program?
- What type of weight management training, experience, education, and certifications do the staff have?

Does the product or program carry any risks?

- Could the program hurt you?
- Could the recommended drugs or supplements harm your health?
- Do participants talk with a doctor?
- Does a doctor run the program?
- Will the program's doctors work with your personal doctor if you have a medical condition such as high blood pressure or are taking prescribed drugs?
- Is there ongoing input and follow-up from a health care professional to ensure your safety while you participate in the program?

How much does the program cost?

- What is the total cost of the program?
- Are there other costs, such as weekly attendance fees, food and supplement purchases, etc.?
- Are there fees for a follow-up program after you lose weight?
- Are there other fees for medical tests?

What results do participants typically have?

- How much weight does an average participant lose and how long does he or she keep the weight off?
- Does the program offer publications or materials that describe what results participants typically have?

If you are interested in finding a weight-loss program near you, ask your health care provider for a referral or contact your local hospital. For additional, general information, contact the Weight-control Information Network (WIN).

Article adopted from: NIDDK: Weight-control Information Network

Weight-control Information Network

1 WIN Way
Bethesda, MD 20892–3665
Phone: (202) 828–1025
Toll-free number: 1–877–946–4627
Fax: (202) 828–1028
Email: WIN@info.niddk.nih.gov
Internet: www.win.niddk.nih.gov

The Weight-control Information Network (WIN) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health, which is the Federal Government's lead agency responsible for biomedical research on nutrition and obesity. Authorized by Congress (Public Law 103–43), WIN provides the general public, health professionals, the media, and Congress with up-to-date, science-based health information on weight control, obesity, physical activity, and related nutritional issues.

Publications produced by WIN are reviewed by both NIDDK scientists and outside experts. This fact sheet was also reviewed by Susan Z. Yanovski, M.D., Director, Obesity and Eating Disorders Program and Co-Director, Office of Obesity Research, NIDDK.

Five Types of Hunger

by Bahram R. Shahmardaan, PhD

SMOG: 7th grade

Obesity causes many adverse health conditions. Many of us become obese because we eat when we are not hungry. Therefore it is essential to understand the different types of hunger that motivate us to eat.

There are five basic types of hunger. They can be classified as:

· **Habit hunger**
· **Mind hunger**
· **Taste hunger**
· **Stomach hunger**
· **Body hunger**

Habit Hunger results from the impresses upon our mind that result from the eating schedules we are accustomed to. So if we are accustomed to eating breakfast at 7 a.m., lunch at 1 p.m. and dinner at 7 p.m., then even when we are not hungry at those times, we will think of eating because our mind is attuned to eating at those times. This is not real hunger. If for some reason, we get busy and the appointed time of eating passes, then if we were really not hungry, the hunger too passes.

The second type of hunger can be termed Mind Hunger. It is similar to habit hunger in that it is not real hunger and is suggested. But the basis is different and therefore needs to be classified as such. When one has been without food for a long time, then even if one is not hungry, one feels one ought to be hungry. For instance if one has missed a meal or is on a fast, one feels one ought to be hungry. This type of hunger too disappears after some time and is not real hunger.

Taste Hunger is the third type of hunger. Quite often after a heavy meal, even if we are not hungry, we will eat dessert. Sometimes, even though we are not hungry, we eat a favorite snack in between meals. This too is not real hunger and with a little discipline we can avoid unnecessary calories.

The fourth hunger is the Stomach Hunger. This is real hunger. This type of hunger is experienced when the stomach becomes empty. At that time one can eat, but if one wants to remain healthy, one should never overeat. Many people often eat before the stomach gets empty. Once they start to eat, they generally overeat, particularly if there are some dishes they are fond of. Overeating stresses the body. This is one reason why many such people improve in health when they simplify their diet or go on a fast

of fruit juices. However in some case, e.g. diabetes, tuberculosis, stomach ulcers etc. fasting can be dangerous.

The fifth type of hunger is Body Hunger. This type of hunger can be dangerous and occurs when the whole body needs food because of famine or fasting. Body hunger will not dissipate with the passage of time. It persists because the body is deprived of nutrition. At such a time, if no other right food is available, one should eat glucose or honey. If no food is provided to the body, the body will draw food from within itself. First it will draw upon the unassimilated food in circulation. Then, it draws upon the sugar reserves stored in different tissues and organs, particularly the liver. After that or simultaneously, it will draw upon the fat reserves. When these reserves are consumed, the body draws upon its own tissues, particularly the vital tissues in different parts of the body, beginning with the muscular tissues. Then, it goes on to the vital organs and ultimately draws upon the nervous system. Once the body begins to draw upon any of the vital tissues, it becomes starvation which can lead to complications and even death.

This is why when, as is often done in naturopathy, a fast is undertaken to effect a cure, it must be conducted under proper supervision of not only a medical practitioner but also an expert having practical experience in dispensing and managing fasts. Such professional management becomes essential when a stage is reached in fasting where adverse chemical changes occur in the bloodstream leading to acidosis, more so when a chronic subacute or acute condition is to be treated with fasto-therapy as the principal therapy.

On the other hand, when the body hunger arises and the fast is broken with the help of right nutrition and other measures, it leads to the cure of various diseases leading to normal health. The right way to break a fast after one feels the body hunger is to start taking juices of fruits and vegetables first and then gradually go on to body building diets under expert supervision.

When an average person gets the feeling of hunger, he does not know whether it is due to habit hunger, stomach hunger or body hunger. Therefore a good rule which helps in maintaining average health is to avoid taking solid food for periods of 12 hours unless contraindicated in case of some particular health issue. So for instance if the last meal of the day is dinner at 9 p.m., one should avoid eating solid foods till at least 9 a.m. the next day. Dr. Mehta recommended that till 12 noon we should have liquid foods such as fruit juices, milk with ovaltine, buttermilk etc. Abstinence from solid foods daily till lunch time, except in the case of medical conditions where it is contraindicated, will help in digesting more easily the food that is taken at other times during the day.

Articles for **A Balanced Eating Plan** channel (being able to manage food through proper planning, storing, preparing, and offering)

Managing Your Feeding and Eating

SMOG: 9th grade

April 16, 2008 • Family Meals Focus #25 • Eating competence: Context-management skills

April 16, 2008
Family Meals Focus #25
Interpreting the news and research about feeding and eating

FMF #21 introduced the concept of the Satter Eating Competence Model (ecSatter). This newsletter addresses one of the four components of ecSatter: skills related to managing the food context. It is excerpted from the second edition of Secrets of Feeding a Healthy Family.

From the perspective of ecSatter, people with effective food context skills do a good job with managing structure and therefore taking good care of themselves with food. People who have food context skills plan for feeding themselves, they take time to eat and they tune in when they eat. They don't just grab food when they get hungry.[1] Our research shows that people who have high overall eating competence scores, and particularly those who have high food context scores, efficiently plan, cook, shop, and manage their food money.[2] In my experience, people with high eating competence use a lot of strategies for seeing to it that they get fed: They cook from scratch, cook using convenience foods and convenient ingredients, and they order out, take out and eat out.

The point of having food context skills is reassuring yourself (and your family) that you will be fed. As I have told you before in this ecSatter series, people with high eating competence experience little of the misery that can surround eating. They are relaxed about eating, relatively satisfied with their bodies, and put the emphasis on food *seeking* rather than food *avoidance*.

Maintaining structure allows eating competence to fall into place:

Structure + food acceptance skills =
Variety and therefore positive nutritional status

Structure + food regulation capabilities =
Energy balance and therefore constitutionally appropriate body weight

To reap the rewards of trustworthy, satisfying, internally regulated eating, you must provide yourself with regular, reliable, rewarding meals as well as sit-down snacks if you need them. To be able to trust your body to help you with the *what* and *how much* of eating, you must provide it with the support it needs.[3] You will do a good job with eating as much as you need of a variety of food if you reliably feed yourself, go to some trouble to make food taste good, and take the time to tune in and enjoy your food. On the other hand, you won't do a good job with the *what* and *how much* of eating if you are casual about feeding yourself, grab food only when you happen to think about it or when hunger drives you to it, absent-mindedly snack and nibble instead of taking time to feed yourself, or chronically restrict yourself.

The trick is being disciplined without becoming negative. There is positive discipline in feeding yourself well. It takes discipline to set up regular and predictable mealtimes, to plan the shopping list, to get the food in the house, to do the cooking and cleanup, to set aside the time to eat, to tune in when you are eating, the list goes on. On the other hand, the discipline becomes negative when you get caught in the *shoulds* and *oughts*: what to eat, what to avoid, how much to eat. "I must eat it because it is good for me." "That is *way* too fattening." "I mustn't let it go to waste." (Insert your guilt trip here.)

When you think of meal planning, think *strategy*, not *rule*s. The primary task is to develop the meal habit. Once you get the meal habit, your body will adjust by getting hungry just before it is time to eat. Start by getting the structure of meals well in place. Build meals based on what you and your family *currently* eat, and cluster those foods into meals and snacks. Do you cook up a box of macaroni and cheese or Tuna Helper to feed the children? Make enough for everyone, put out a plate of bread and butter and a carton of milk, sit down together and all share the same food. Eaters can generally manage bread and butter if all else fails. If drinking milk turns your meal into a chore or a bore, start by drinking what you drink. Do you order out for pizza and leave it on the kitchen counter for everyone to help themselves? Arrange to have it delivered at mealtime, then sit down together to eat it.

After you get used to the idea of structure, it is safe enough to gradually expand your menus. In fact, structure more-or-less triggers filling in the blanks with menus, opening a can of fruit, throwing together a salad. However, the bottom line is pleasure. To keep up the day-in-day-out effort of structured meals, those meals must be richly rewarding to plan, prepare, provide and eat.

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Healthy Eating Across Your Lifespan

SMOG: 6th grade

A balanced eating plan is a building block of good health. Poor eating habits may lead to overweight and related health problems. By eating right, you may reach or maintain a healthy weight. You may also improve your physical health, mental well-being, and set an example for others. Do it for yourself and your family!

Healthy Eating: What is a healthy eating plan?

A healthy eating plan:

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

For more specific information about food groups and nutrition values, visit: www.healthierus.gov/dietaryguidelines.

Tips for Healthy Eating

- Eat breakfast every day. People who eat breakfast are less likely to overeat later in the day. Breakfast also gives you energy and helps you get your day off to a healthy start.
- Choose whole grains more often. Try whole-wheat breads and pastas, oatmeal, brown rice, or bulgur.
- Select a mix of colorful vegetables each day. Vegetables of different colors provide different nutrients. Choose dark leafy greens such as spinach, kale, collards, and mustar greens, and reds and oranges such as carrots, sweet potatoes, red peppers, and tomatoes.
- Choose fresh, canned, or frozen fruit more often than fruit juice. Fruit juice has little or no fiber, and the calories may be high. Fresh, canned, or frozen fruit is often better for you. If you eat canned fruit, opt for fruit packed in water rather than syrup.
- Use fats and oils sparingly. Olive, canola, and peanut oils, avocados, nuts and nut butters, olives, and fish provide heart-healthy fat as well as vitamins and minerals.
- Eat sweets sparingly. Limit foods and beverages that are high in added sugars.
- Eat three meals every day. If you skip meals or replace a meal with a snack, you might overeat later on.
- Have low-fat, low-sugar snacks on hand. Whether you are at home, at work, or on the go, healthy snacks may help to combat hunger and prevent overeating.

Quick Breakfast Ideas

- low-fat yogurt sprinkled with low-fat granola
- oatmeal with low-fat or fat-free milk, or soy-based beverage
- a slice of whole-wheat toast with a thin spread of peanut butter
- fruit smoothie made with frozen fruit, low-fat yogurt, and juice
- high-fiber, low-sugar cereal with soy-based beverage or low-fat milk

Easy Snack Ideas

- low-fat or fat-free yogurt
- rice cakes
- fresh or canned fruits
- sliced vegetables or baby carrots
- dried fruit and nut mix (no more than a small handful)
- air-popped popcorn sprinkled with garlic powder or other spices
- high-fiber, low-sugar cereal

Healthy Weight: What is a healthy weight?

Body mass index (BMI) is one way to tell whether you are at a healthy weight, overweight, or obese. It measures your weight in relation to your height.

A BMI of 18.5 to 24.9 is in the healthy range. A BMI of 25 to 29.9 is overweight, and a BMI of 30 or greater is considered obese.

Sources: George Bray, M.D., Pennington Biomedical Research Center.
National Heart, Lung, and Blood Institute's *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.*

2010 Dietary Guidelines: A Blueprint for Health

SMOG: 9th grade

Every five years, the USDA and Health and Human Services review and update the Dietary Guidelines for Americans, a set of recommendations designed to improve the nation's health. The dietary guidelines are evidence based, utilizing the most current scientific research. Because more than one third of children, 72% of men, and 64% of women are overweight or obese, the 2010 guidelines emphasize improving food choices and increasing physical activity to achieve a healthy weight. Even people at a healthy weight will benefit from choosing foods high in vitamins and minerals and participating in regular physical activity.

The basics of the 2010 guidelines differ very little from 2005. Two broad topics are emphasized: balance calories to achieve and maintain a healthy weight and focus on consuming nutrient-dense foods and beverages. Key recommendations include the following:

• Nutrients (vitamins, minerals, fiber) should come from foods, not from fortified foods and supplements.

• Get off the couch or out of your chair and increase your activity level.

• Eat more dark green (eg, broccoli, kale, spinach), red (eg, beets, apples, tomatoes), and orange (eg, carrots, winter squash, peaches) fruit and vegetables for important nutrients.

• Choose whole grains at least 50% of the time. Look for the word "whole" in the first word on the list of ingredients for a product.

• Decrease sugar intake by drinking water instead of sweetened beverages.

• Eat seafood more often. Replace meat or poultry at least two times per week with a total of 8 ounces of seafood or more.

• Plan meals to include plant-based foods such as nuts, seeds, vegetables, fruit, whole grains, and legumes (eg, chickpeas, lentils, kidney beans).

• Replace fats that are solid at room temperature with liquid oils.

• Consume less sodium. The general recommendation is to consume no more than 2,300 milligrams of sodium per day. If you're over age 51, black, or have diabetes, high blood pressure, or chronic kidney disease, you need even less—no more than 1,500 milligrams per day.

• Enjoy your food but in smaller amounts to help maintain a healthy weight.

• Consume no more than 10% of your daily calories from saturated fat. If you eat 1,200 calories, that's 13 grams of saturated fat per day. For 1,500 calories, the goal is 16 grams, and for 1,800 calories, you should have no more than 20 grams of saturated fat per day.

• Keep your foods safe: Wash your hands, clean fruit and vegetables before eating, cook foods to safe internal temperatures, and refrigerate foods promptly.

Adopted from the Website: Today's Diet and Nutrition - 2010 Dietary Guidelines: A Blueprint for Health
http://www.tdn-digital.com/article_030111.shtml
— *Lynn Grieger, RD, CDE, cPT*

Controlling Portion Sizes
SMOG: 7/8th grade
As meals swell to "super-size," so do American waistlines

It seems like everything these days is "super-sized." Cutting back on sugar, fat, and calories can be as simple watching your portion sizes, especially of foods high in fat and sugar.

Eating smaller portions of food is one of the easiest ways to cut back on calories – but it can also be one of the most challenging, with the current trend of super-sizing. Huge portions, all-you-can-eat-buffets, and extra-large "single servings" of chips, candy bars, and other snack foods can all lead to overeating.

How do you know a reasonable portion of food when you see it? Visualize the objects mentioned below when eating out, planning a meal, or grabbing a snack. For example, the amount of meat recommended as part of a healthy meal is 3 to 4 ounces – it will look about the same size as a deck of cards.

The look of normal portion sizes

> 1 oz. meat = size of a matchbox
> 3 oz. meat = size of a deck of cards or bar of soap (the recommended portion for a meal)
> 8 oz. meat = size of a thin paperback book
> 1 medium potato = size of a computer mouse

Even some bagels have become super-sized, which gives this reasonably healthy breakfast item a high calorie count. Bakeries and grocery stores often carry jumbo bagels that measure 4¼ inches across and contain 300 to 400 calories each. A regular, 3-inch-diameter bagel has about 150 calories.

To eat smaller portions try the following ideas

When eating out

- Choose a regular single hamburger at your favorite fast food stop instead of the larger burger or the double burger.
- Have the small fries instead of the super-sized.
- Order a small soda or, even better, drink water.
- Share an entrée with a friend when you go to a restaurant.
- Ask for half your meal to be packed for you and eat it for lunch the next day.

At home

- Don't "eat from the bag." When snacking, place a few chips, crackers, or cookies in a bowl to help keep from overeating.
- Buy single portions of snack foods so you're not tempted by the whole bag or box.
- Like butter and sour cream on your baked potato? Mayonnaise and cheese on your sandwich? Cream cheese on your bagel? Use half the amount you usually do – and save even more calories by using low-fat varieties.

Boost servings of fruits and vegetables

The American Cancer Society (ACS) recommends at least 2½ cups of fruits and vegetables each day to help prevent cancer. Substitute low calorie, high-fiber fruits and vegetables for higher calorie foods and snacks – it will help you get the fruits and vegetables you need, feel full, and save on calories!

Last Medical Review: 01/12/2012
Last Revised: 01/12/2012

http://www.cancer.org/Healthy/EatHealthyGetActive/TakeControlofYourWeight/controlling-portion-size

Tuscan-Style Grilled Chicken Kebabs

- Serves: 4; 2 kebabs (3 ounces chicken and 1/2 cup vegetables) and 1/2 cup brown rice per serving

Description
These grilled chicken-and-vegetable kebabs feature the flavors of sunny Tuscany -- lemon, rosemary, garlic, and oregano.

Ingredients

1 teaspoon grated lemon zest
2 tablespoons fresh lemon juice
1 tablespoon chopped fresh rosemary or 1 teaspoon dried rosemary, crushed
2 teaspoons olive oil
2 medium garlic cloves, minced
1 teaspoon dried oregano, crumbled
1/4 teaspoon crushed red pepper flakes
1 pound boneless, skinless chicken breast halves, all visible fat discarded, cut into 16 cubes
16 whole button or cremini mushrooms (about 1/2 ounce each), ends trimmed
1 medium green bell pepper, cut into 16 pieces
16 cherry tomatoes
Cooking spray
1/2 cup uncooked instant brown rice
1 cup fat-free, low-sodium chicken broth
1/4 cup dry-packed sun-dried tomatoes, cut into 1/4-inch squares

Cooking Instructions

In a medium nonmetallic bowl, stir together the lemon zest, lemon juice, rosemary, oil, garlic, oregano, and red pepper flakes. Add the chicken, stirring to coat. Cover and refrigerate for at least 15 minutes. The chicken can marinate for up to 8 hours for even more flavor. Turn several times if marinating for more than 30 minutes.

Soak eight 8-inch wooden skewers for at least 10 minutes in cold water to keep them from charring, or use metal skewers. Preheat the grill on medium high.

Drain the chicken and discard the marinade. Alternately thread the chicken, mushrooms, bell pepper, and tomatoes on the skewers. Lightly spray all sides with cooking spray.

In a medium saucepan, bring the broth and tomatoes to a boil over high heat. Stir in the rice. Reduce the heat and simmer, covered, for about 10 minutes. Remove from the heat and let stand for about 5 minutes. Fluff with a fork.

Meanwhile, grill the kebabs for 2 to 3 minutes on each side (8 to 12 minutes total), or until the chicken is no longer pink in the center and the vegetables are tender. Serve with the rice on the side.

Cook's Tip

These grilled chicken-and-vegetable kebabs feature the flavors of sunny Tuscany—lemon, rosemary, garlic, and oregano. Serve them with brown rice studded with sun-dried tomatoes for a rustic and satisfying dinner.

Nutritional Analysis	Per serving
Calories Per Serving	213
Total Fat	2.5 g
Saturated Fat	0.5 g
Trans Fat	0.0 g
Polyunsaturated Fat	0.5 g
Monounsaturated Fat	0.5 g
Cholesterol	66 mg
Sodium	16 mg
Carbohydrates	16 g
Fiber	3g
Sugar	4 g
Protein	31 g

Dietary Exchanges: 1/2 starch, 1 vegetable, 3 very lean meat

Tips for Eating Right

Everyday Eating Tips

Small steps can help your family get on the road to maintaining a healthy weight. Choose a different tip each week for you and your family to try. See if you or they can add to the list. Here are a few:

Change Your Shopping Habits

- Eat before grocery shopping
- Make a grocery list before you shop
- Choose a checkout line without a candy display
- Buy and try serving a new fruit or vegetable (ever had jicama, fava beans, plantain, bok choy, star fruit, or papaya?)

Watch Your Portion Size

- Share an entree with someone
- If entrees are large, choose an appetizer or side dish

- Don't serve seconds
- Share dessert, or choose fruit instead
- Eat sweet foods in small amounts. To reduce temptation, don't keep sweets at home
- Cut or share high-calorie foods like cheese and chocolate into small pieces and only eat a few pieces
- Eat off smaller plates
- Skip buffets

Change the Way You Prepare Food

- Cut back on added fats and/or oils in cooking or spreads
- Grill, steam, or bake instead of frying
- Make foods flavorful with herbs, spices, and low-fat seasonings
- Use fat-free or low-fat sour cream, mayo, sauces, dressings, and condiments
- Serve several whole-grain foods every day
- Top off cereal with sliced apples or bananas

Change Your Eating Habits

- Keep to a regular eating schedule
- Eat together as a family most days of the week
- Eat before you get too hungry
- Make sure every family member eats breakfast every day
- Drink water before a meal
- Stop eating when you're full
- Don't eat late at night
- Try a green salad instead of fries
- Ask for salad dressing "on the side"
- Chew slowly every time you eat and remind others to enjoy every bite
- Serve water or low-fat milk at meals, instead of soda or other sugary drinks
- Pay attention to flavors and textures
- Instead of eating out, bring a healthy, low-calorie lunch to work and pack a healthy "brown bag" for your kids
- Provide fruits and vegetables for snacks
- Ask your sweetie to bring you fruit or flowers instead of chocolate

(*Source*: Adapted from www.smallstep.gov)
Keep track of tips you've tried with our tracking sheet (48 KB).

Did you know?

Small steps to get your children to move more can help the whole family maintain a healthy weight. Try these tips for you and your family.
We Can! is a collaboration between the National Heart, Lung, and Blood Institute, the National Institute of Diabetes and Digestive
and Kidney Diseases, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, and the National Cancer Institute.
We Can! Ways to Enhance Children's Activity & Nutrition, **We Can!**, and the **We Can!** logos are registered trademarks of the U.S. Department of Health & Human Services (DHHS).

We Can! Try Tips To Eat Well and Move More Tracking Sheet

Pick a tip each week from the list of Everyday tips to help you eat well and move more! Fill in the tips on this tracking chart to encourage you to keep it up. Put the tracking sheet on your refrigerator or other central location for your family to see that you are making steps toward maintaining a healthy weight.

Week	Eating Well Tip	Moving More Tip	Notes
Week 1 (___/___)			
Week 2 (___/___)			
Week 3 (___/___)			
Week 4 (___/___)			
Week 5 (___/___)			
Week 6 (___/___)			

VITA

Graduate School
Southern Illinois University

Matthew T. Moyer
mtmoyer12@yahoo.com

Canisius College
Bachelor of Science, Physical Education, May 1995

University of Alabama
Master of Arts, Health Science, December 2004

Special Honors and Awards:
    Department nominee for the Graduate Assistant Award for Outstanding Teaching in the
    College of Education and Human Services (November 2008)

Dissertation Title:
    Use of an Interactive Web-based Platform, Founded on Constructs from the Social
    Cognitive Theory, to Benefit Eating Competence

Major Professor: Stephen L. Brown

Publications:
    Nobiling, Moyer, Ferre. Measuring knowledge, attitudes, and behavior of undergraduate
    students at an Illinois university in regards to on-campus smoking compliance. *The
    Health Education Student Monograph Series*. Volume 26, Number 1, 2009.