

ABSTRACT

Title of Document: UNDERSTANDING FOOD LABEL USE BY
COLLEGE STUDENTS

Ayma Rouhani, 2015

Directed By: Dr. Sharon M. Desmond, Associate Professor,
University of Maryland School of Public Health
Department of Behavioral and Community Health

Researchers have found food labels can be used to promote healthier food choices leading to improved nutrition and decreased risk of chronic disease (Silverglade and Heller, 2010; Drichoutis, Lazaridis, and Nayga, 2006; Kim, Nayga and Capps, 2000; Taylor and Wilkening, 2008; Todd and Variyam, 2008). However, actual use of food labels by the public must increase (Grunert and Wills, 2007; Ollberding, Wolf, Contento, 2011). In-depth interviews (N=15) were conducted with college students to qualitatively explore reasons why they used or did not use food labels, factors that motivated or inhibited label use and perceptions regarding the Food and Drug Administration's (FDA) new proposed food label. Reactions regarding the new food label were positive overall, and this study found that among college students there is a need to promote more favorable attitudes towards food labels, address negative social norms, and equip these students with tools to better understand food labels, promoting self-efficacy.

UNDERSTANDING FOOD LABEL USE BY COLLEGE STUDENTS

By

Ayma Martha Rouhani

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Public Health
2015

Advisory Committee:

Associate Professor Sharon M. Desmond, Chair

Associate Professor Linda Aldoory

Associate Professor Donna E. Howard

© Copyright by

Ayma Rouhani

Fall 2015

Dedication

To my mother, my biggest role model, my hero, and also the strongest, wisest and most loving person I know. You teach me so much every single day and I am immensely grateful to God that I get to have you as my mother.

Acknowledgements

To my angels in heaven: Maman Akhtar, Baba Enayat, Madar, and Daei Iraj for always watching over me from up above.

To my mom and dad: for always believing me and encouraging me to reach for the stars and follow my dreams. It is because of your unwavering love, support and sacrifices that I am who I am today.

To my (not so baby anymore) baby brother: thank you for all your support and love. Your passion and drive is inspiring and I am so proud of you and the person you have become!

To my advisor, Dr. Desmond: I will never forget the excitement I felt meeting you for the first time and learning that you had also been my aunt's advisor. Your kindness, encouragement, wisdom and mentorship have caused me to feel truly supported throughout my MPH journey. I feel so lucky to have you as an advisor and mentor. Thank you for being such an amazing inspiration to two generations of Rouhani women!

To my committee members: Dr. Howard, I will eternally be grateful to have taken your class in the fall of 2013. You lit a fire of love for behavioral health inside of me and after several meetings in your office I knew I had to transfer into the BCH department. Thank you for your continued encouragement and support, and especially as I was making this pivotal decision, which was ultimately one of the best decisions of my life! Dr. Aldoory, thank you for all the incredible opportunities you have given me to apply what I learn in class to the real world. Working with you has taught me so much and has been a constant inspiration. I truly hope to one day serve and lead in the way that you do!

And last but certainly not least, to Michel, my husband, my best friend and biggest supporter. Thank you for all your patience, love and for all the laughter you bring to my life. Thank you for always listening to me (albeit sometimes pretending) as I read my papers out loud, rant on and on about my love for public health, my dreams and aspirations--life is so sweet with you by my side.

Table of Contents

Table of Contents.....	iv
List of Figures.....	vi
List of Tables.....	vii
Chapter 1: Introduction.....	1
Statement of Research Problem.....	2
Study Significance and Purpose.....	5
Specific Aims and Research Questions.....	7
Definition of Terms.....	8
Chapter 2: Background and Literature Review.....	10
Food Label Policy	11
Food Label Use.....	15
Theoretical Constructs.....	25
Chapter 3: Methods.....	28
Sampling.....	29
Data Collection	30
Data Analysis.....	32
Chapter 4: Results.....	35
Participants.....	36
Findings.....	36
Social Norms.....	37
Understanding Food Labels and Self- Efficacy.....	46
Label Use.....	53
Decisional Balance.....	52

Current Food Label Content.....	54
New Food Label.....	55
Food Label Education.....	56
Chapter 5: Discussion	58
Conclusion and Recommendations.....	64
Strengths and Limitations.....	66
Appendices	68
Appendix A: IRB Approval.....	68
Appendix B: Recruitment Flier for Interviews.....	70
Appendix C: FYI Listerv Post.....	71
Appendix D Recruitment Tracking Database:.....	72
Appendix E: Cognitive Interview Script and Questions.....	73
Appendix F: Informed Consent Form:.....	80
Appendix G: Starting List of Themes	83
Appendix H: Sample of Initial Identification of Themes by Interview Question.....	84
Appendix I: Sample of Theme Database.....	85
References.....	86

List of Figures

Figure 1: Theoretical Conceptual Framework.....	7
Figure 2: Original Vs. Proposed Food Label.....	14
Figure 3: The Transtheoretical or Stages of Change Model.....	26
Figure 4: Inductive Data Analysis Procedures	33
Figure 5: Food Label for Ice Cream Container	74
Figure 6: New Proposed Food Label Format	76

List of Tables

Table 1: Primary Themes.....	37
Table 2: Salient Themes and Subthemes for Norms and Self-efficacy.....	37

Chapter 1: Introduction

The Problem

Study Significance and Purpose

Specific Objectives

Definition of Terms

The Problem

The rising levels of obesity and increasing prevalence of chronic diseases in the United States, as well as the high mortality rates and financial and quality of life costs linked to these diseases, require immediate attention and action (Trust for America's Health, 2013). In the past thirty years adult obesity has doubled and childhood obesity has tripled, leaving more than two-thirds of Americans obese or overweight, resulting in an exponential increase in populations with a chronic disease associated with a lack of proper nutrition (Trust for America's Health, 2013).

There are three behaviors most relevant to an individual's health outcomes, physical activity, the decision of whether or not to smoke, and proper nutrition, defined as "eating foods of high nutritional value and in the right quantities" (Trust for America's Health, 2009, p.8). Eating habits in particular have a great bearing on health conditions, including risk of "coronary heart disease; stroke; cancers of the colon, breast, and prostate; and diabetes" (Adler and Newman, 2002, p.82). Despite the importance of healthy eating and proper nutrition to a person's overall health, Americans consume about 300 additional calories each day than they did in the 1980's (Trust for America's Health, 2009). A higher portion of these calories comes from fat and sugar, while the consumption of healthy grains, milk, fruits and vegetables is "woefully low" (Trust for America's Health, 2009, p.9). This shows a general decline in nutrition and an increase in unhealthy eating habits by the general public.

Compared to other countries, health care spending in the United States is almost double, yet we still have relatively poorer health outcomes (Preston and Alexander, 2010). If increasing trends for obesity and chronic diseases continue, it is estimated

twenty five years from now, the United States' population will consist of more than forty-four million individuals with type 2 diabetes (Williams, McClelland, and Rivlin, 2010). The annual cost of providing health care for these individuals with this one condition, will “triple to \$336 billion, in 2007 dollars” (Williams, McClelland, and Rivlin, 2010, p. 1482). These statistics demonstrate that despite our high spending, Americans are sicker than ever, mostly due to diseases that can be prevented through healthy habits such as nutritious eating (Trust for America's Health, 2009). The high financial, personal and physical costs of nutrition related chronic conditions make it important to increase public health efforts aimed at improving nutrition and healthier eating.

One way to help people improve their eating habits is to increase consumer food label use for the purpose of planning healthy diets or meals (Misra, 2002). Food labels, specifically the Nutrition Facts Label, provides percent daily value information that can show a person how a food item fits into her/his daily nutrition needs, and can “highlight information on fat, saturated fat, cholesterol and sodium” (Misra, 2002, p.307). In this paper the term food label will be used synonymously with the Nutrition Facts Label. Food labels, in addition to providing basic information about dietary guidelines, can potentially contribute to: a) motivating consumers to eat more healthily, b) more informed consumer decisions, and c) healthier food choices and eating habits (Cowburn and Stockley, 2005; Silverglade and Heller, 2010; Drichoutis, Lazaridis, and Nayga, 2006; Kim, Nayga, and Capps, 2000; Ollberding, Wolf, Contento, 2011; Taylor and Wilkening, 2008; Todd and Variyam, 2008). Labels provide percent daily value

information that can show how a food item “fits daily nutrition needs,” and “highlight information on fat, saturated fat, cholesterol and sodium.”

In 2006 the Food and Drug Administration (FDA) modified the nutrition label to include the grams of trans fat per food item serving (Silverglade and Heller, 2010). It was estimated this change alone could result in yearly savings of \$4.1 to \$8.3 billion by preventing, annually, six to twelve hundred coronary heart disease cases and 240 to 480 deaths (Silverglade and Heller, 2010; FDA, 2013). Investment in food label promotion activities is likely cost effective in the long term and should be a priority. Consumers also need to be conscious of the advertising tactics of the food industry, their personal food purchasing decisions and habits, the direct impact food choices have on their health and they need to understand food labels and how to effectively use them (Ollberding, 2011; Sanlier and Karakus, 2010).

Americans are exposed to thousands of food advertisements every year and a major contributing factor to poor nutrition and increasing obesity rates is children’s exposure to advertisements of unhealthy foods (Mello, Studdert, and Brennan, 2006). Often these advertisements “shape product preferences and eating habits” (Mello, 2006, p.2601). In theory, the use of food labels can contribute to more informed decisions that work against consumer impulses caused by advertisements (Mello, 2006). Although food labels can be used to counteract the significant influence of advertisements, actual food label use is low and sometimes when looking at food labels, consumers may not understand the nutrition information provided (Grunert and Wills, 2007; Ollberding, 2010).

If food labels are to significantly influence food choices and improve nutrition, use of labels must increase (Grunert and Wills, 2007; Ollberding, 2011). The low rate of food label use is due to many factors including a lack of literacy and poor label content (Cowburn and Stockley, 2005; Swartz, Braxton, and Viera, 2011). The Food and Drug Administration (FDA) has recently proposed new updates to improve content and presentation of food labels (FDA, 2014).

One age group especially important to target is college students, given their overall poor nutrition and that many are making decisions about what foods to purchase and eat for the first time (Marietta, Welshimer, and Long Andersons, 1999). They are in the process of establishing lifelong eating habits that often determine future tastes and patterns that can influence health and risk of chronic diseases (Deshpande, D. Basil, and Z. Basil, 2009; Marietta et al., 1999). To increase effective label use in college population, it is important to understand factors that motivate or inhibit their label use, and then address these factors through nutrition and food label education.

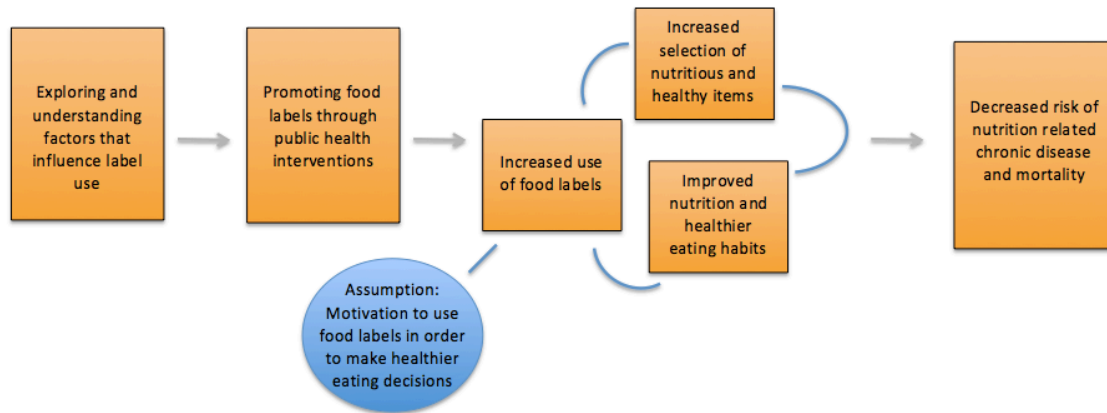
Study Significance and Purpose

Many researchers have explored factors related to label use, and have found it is important to increase rates of use (Cowburn and Stockley, 2005; Ollberding, 2010; Swartz et al., 2011). Hieke (2012), in a “Critical Review of the Literature on Nutritional Labeling,” argues that previous researchers have been more narrow in their research focus and there is a need for in-depth interviews that can provide insights on cognitive processes addressing “why” questions related to label use (2012). Thus, this study uses in depth interviews to explore food label use by college students to

understand and address “why” questions related to food label use. Again, to promote label use we must first understand perceptions related to label use (Drichoutis et. al., 2006; Taylor and Wilkening, 2008; Todd and Variyam, 2008). Researchers have also recommended further food label education to promote its use (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Guthrie et. al, 1995; Smith, Taylor and Stephen, 2000; Taylor and Wilkening, 2008). By better understanding college students’ perceptions related to reading food labels and engaging in food purchasing/selection behaviors, this study provides new information contributing to the current literature on food labels and nutrition education and promotion.

The purpose of this study was to qualitatively explore the reasons why college students do or do not use food labels, and factors that motivate or inhibit their label use. This study gave college students an opportunity to suggest ways future public health programs can address challenges students’ perceive prevent them from reading labels and also possible ways to encourage label use. This information can be valuable in developing effective educational strategies to reach college students to increase their label use (Marietta et. al, 1999; Misra, 2007). Another aim of this study was to explore college students’ perceptions regarding the new proposed food labels. The timing of the study is beneficial given current political attention to improve food label information. It is hoped this exploratory study can provide insight into perceptions and attitudes of college students’ regarding label use that may be used in future public health interventions to supplement new FDA updates to the food labels to effectively increase label use, improve nutrition habits and eating patterns and consequentially decrease their risk of chronic disease and mortality (Figure 1).

Figure 1: Theoretical Conceptual Framework: Improving Nutrition and Decreasing Chronic Disease Through Label Use



Specific Aims and Research Questions

The specific aims of this study were to (1) Explore factors that may motivate or prevent college students from using or frequently using food labels to support healthier eating habits (2) Explore college students' perceptions regarding the new proposed FDA food labels; (3) Examine whether college students find the new proposed food label easy to understand, or they find them difficult to use, and if so, reasons why; (4) Gather information that may be useful in the future for the development of programs encouraging effective food label use among college students.

Related research questions:

1. What factors motivate or prevent college students from using or frequently using food labels to support healthier eating habits?
2. What are college students' perceptions regarding the new proposed FDA food labels?

3. Do college students find the new proposed food label easy to understand or difficult to use and why?
4. What are some strategies that may be useful in the future for the development of programs encouraging effective food label use among college students?

Definition of Terms

Cognitive Interview: Cognitive interviewing is a technique that allows individuals to verbalize their feelings and thought processes (Beatty and Willis, 2007). This interviewing technique helps researchers gain insight into perceptions that influence decision-making (Shafer and Lohse, 2005).

Label Use: Label use refers to the behavior of reading and using food labels when making decisions about what foods to purchase and eat (Ollberding, 2010).

Healthy Eating: According to the USDA's 2010 Dietary Guidelines for Americans, healthy eating emphasizes nutrient dense foods such as fruits, vegetables, low or non-fat milk products, whole grains, lean meats, poultry, fish, beans, eggs and nuts. A healthy eating pattern also includes limiting consumption of solid fats, cholesterol, sodium, refined grains and added sugars and is within a person's daily caloric requirements (USDA, 2010).

Nutrition Facts Label: Under the Federal Food, Drug, and Cosmetic Act the provision of a nutrition facts label is a requirement for most prepared foods. These include "breads,

cereals, canned and frozen foods, snacks, desserts, drinks, etc.” (FDA, Food: Labeling and Nutrition, 2015). The label provides specific information about the product, such as the serving size, calories, and nutrient information as well as a footnote on daily values for diets of 2,000 and 2,500 calories (FDA, Food: Labeling and Nutrition, 2015).

Chapter 2: Background and Literature Review

Food Label Policy

Food Label Use

Theoretical Constructs

Food Label Policy

Food nutrition labeling is regulated by the FDA and the U.S Department of Agriculture (USDA) and is a requirement for most packaged foods (FDA; Ollberding et. al, 2010; Rothman et al., 2006). The Nutrition Labeling and Education Act (NLEA) of 1990 made the previously voluntary system of food labeling that began in the 1970's mandatory (FDA; Taylor and Wilkening, 2008; USDA, 2015). Prior to the 1990's the labeling of foods was voluntary except for products that included a nutrition claim, or if nutrients were added to the food item (Taylor and Wilkening, 2008). The NLEA set mandatory requirements that food labels on packaged items must include the nutritional content of the food item and that health and nutrition claims meet FDA regulations (FDA; Kolodinsky, 2008). The policy, enforced for the majority of food products, also requires that nutrition claims be accurate, i.e. not misleading to consumers (Caswell and Padberg, 1992; FDA). The USDA, responsible for food items such as meat, poultry and eggs, generally applies FDA rules to its own policies, although some requirements, such as regulation regarding "all natural" claims on poultry, are weaker than the FDA's (Silverglade and Heller, 2010; USDA, 2015).

A recent comprehensive report of food label policy recommendations by the Center for Science in the Public Interest (CSPI) calls for the FDA and the USDA to standardize their policies and adapt uniform food labeling requirements to improve clarity and efficiency (Silverglade and Heller, 2010). In addition, they argue a lack of policy prioritization, enforcement, and public education about food labels, as well as poor label content has resulted in low rates of label use by the public (Silverglade and Heller, 2010). One of the major challenges the FDA and USDA have in implementing

label regulations is the tension and backlash they face from the food industry (Mello et al., 2006). The food industry and certain consumer groups argue that increased label regulations infringe on civil liberties and intervene in freedoms of speech, contract and choice (Mello et al., 2006). The broad nature and scope of labeling issues as well as the influence of the food industry, often competing with FDA and USDA priorities, pose further challenges in regulating food labels (Silverglade and Heller, 2010).

Despite labeling requirements set into motion through the NLEA in 1996, two years following the new policy, about seventy percent of consumers still wanted labels to be easier to understand, demonstrating the need for additional label modifications and increased education on using food labels (Kristal et. al., 1998). In 2006, the FDA updated the food nutrition label by requiring inclusion of the grams of trans fat per food item and in 2012 they took further steps to regulate food labels (Silverglade and Heller, 2010). For example, the Center for Food Safety and Applied Nutrition, responsible for carrying out FDA activities, sent a notice to seventeen food manufacturers informing them the labeling of several of their food items violated federal policies (FDA, 2012). In addition, the FDA created a campaign to educate children and teens aged nine to thirteen on label use (FDA). For this campaign the FDA created educational materials and games to be used by children, parents, and health educators to increase “tween” knowledge about food label nutrition facts, hopefully promoting increased label use (FDA, 2015).

However, despite these recent enforcement efforts, a significant problem with food labels remains—information requirements are outdated. Current label information is based on FDA 1993 regulations regarding food servings for a hundred and forty food

categories that were developed as a result of nation wide surveys conducted twenty years ago, in the 1980's (Silverglade and Heller, 2010). Recently, political actions have focused on improving label content, increasing regulation, and prioritizing food label policy in the broader context of addressing the obesity epidemic (Mello et al., 2006). Researchers, health experts and consumers have called for food label reform, which can help consumers make healthier eating decisions, encourage companies to offer healthier food options, and reduce the financial costs of nutrition related chronic conditions (Cowburn and Stockley, 2005; Silverglade and Heller, 2010; Todd and Variyam, 2008).

Proposed New Labels

Recently, the FDA has proposed new updates to food labels to provide a simpler design, include a “greater understanding of science” and update serving size labeling requirements, all in an effort to make labels easier to understand (FDA, 2014; Figure 2). The proposed changes were published in the Federal Register for the public to read and comment on in the summer of 2014 (FDA, 2014). Some research has been conducted to assess consumer response to specific components of the proposed new food label. In a study examining adult consumers' perceptions (N=9,493) Lando (2013) found that using a single serving format (a component of the new food label) can be more effective in assisting consumers in making healthier food choices. A study conducted by the International Food Information Council (IFIC, 2014) (N=1,088) found the inclusion of added sugars, another addition to the proposed food label, may not be effective without education about added sugars, as it is not a concept sufficiently understood by adult consumers. The new proposed updates to food label regulation is

an important step toward modernizing and providing more accurate information, but there are still issues that are not being addressed. One example is that despite the new changes, food labels can still include misleading and confusing terms such as “enriched” flour in the ingredient list which a consumer may still mistake for being “whole grain” due to false claims on the package (Silverglade and Heller, 2010; Grunert and Wills, 2007). No final rule has been made regarding the new proposed food labels, and if implemented, the food industry will be responsible for complying with the new updates within two years of the final ruling (FDA, 2014). As of July 2015, following the implementation of this study, supplemental revisions were made to the proposed food label to include a percent daily value for added sugars and a change to the footnote to better explain percent daily value. As the two updates to the food label were made after a majority of the interviews for this study had already taken place, perceptions of these two additions were not explored.

Figure 2: Original (left) vs. Proposed Food Label (right)



Food Label Use

Label Use and Benefits

Many researchers have found food label use can promote healthier food choices, leading to improved nutrition and decreased risk of chronic disease (Silverglade and Heller, 2010; Drichoutis et. al., 2006; Kim et. al, 2000; Taylor and Wilkening, 2008; Todd and Variyam, 2008). Although food labeling alone is not enough to alter eating behaviors, it can be used as an important motivating tool that, if used effectively, can assist in combatting obesity and nutrition related chronic disease (Ollberding et al., 2010). Food labeling is part of a comprehensive population based strategy that can help improve the consumer food selection environment through the provision of important nutrition information, potentially leading to healthier decision making (Cowburn and Stockley, 2005; Silverglade and Heller, 2010; Todd and Variyam, 2008). The provision of food information can empower and inform consumers about food products (Cowburn and Stockley, 2005).

Food labels provide nutrient content and ingredient information about food items that can be used by consumers to identify healthy foods items high in vitamins, minerals, fiber, and assist them in avoiding less healthy foods high in fat, sodium or calories (Brecher et. al, 2000; Todd and Variyam, 2008). Nutrition information can also affect purchasing behavior by influencing consumer perceptions of food items as well as how they value the product (Drichoutis et. al., 2006). Researchers found label use improves nutrient intake such as increasing consumption of dietary fiber and reducing calories from total and saturated fats, sodium and cholesterol (Drichoutis et. al., 2006; Kim et. al, 2000), demonstrating food labels can be beneficial and an important tool for

consumers. By potentially improving dietary choice, food labels can be used to reduce the risk of current leading causes of death in the United States, such as heart attacks, diabetes, stroke and some forms of cancer, as well as reducing the exponential costs of nutrition related chronic diseases (Silverglade and Heller, 2010). Ultimately, however, it is likely the benefits of food labeling and its efficacy will increase if food label information is accompanied by educational campaigns for the public (Drichoutis et. al., 2006; Taylor and Wilkening, 2008).

There is a lack of research on food labels that explore “why” questions regarding what motivates consumers to use food labels, as well as how and whether food label information is actually used to influence food choices (Hieke and Taylor, 2012). Many researchers examining food label use have been “very narrow in their research focus,” creating a need for more in-depth interviewing that explores cognitive processes consumers experience when using food labels in a real life setting, rather than assessing self reported knowledge regarding nutrition (Hieke and Taylor, 2012, p.148). In addition, there is a need for more information about what types of strategies can be used to increase knowledge about how to use food labels and increase their use (Cowburn and Stockley, 2005). Todd and Variyam (2008) uncovered a decline in label use specifically from 1995/1996 to 2005/2006, in a sample of 8,768 individuals, and argue it is important for researchers to further investigate and understand factors contributing to decreased use. Qualitative research focusing specifically on college students is also limited. Another issue is that there has been heavy reliance on female samples, which influences the generalizability of findings (Hieke and Taylor, 2012).

Factors Contributing to Low Label Use

Some researchers also found actual use of food labels may be considerably lower than self reported use and if food labels are to significantly influence food choices and improve public health, rates of food label use must increase (Cowburn and Stockley, 2005; Ollberding et. al., 2010). There are many factors contributing to low rates of label use, including lack of nutrition knowledge, low literacy, confusion, low motivation and a perceived lack of time. Consumers often have difficulty understanding food labels due to poor health literacy, and even individuals with higher literacy find it difficult to perform more complex tasks such as interpreting and calculating numeric food label nutrition information to determine what food items they should select that are healthy (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Swartz et al., 2011; Rothman et. al., 2006). Consumers may look at a food label, understand some of the information, but be confused by other information (Cowburn and Stockley, 2005). In addition, most individuals do not have sufficient knowledge about basic nutrition to understand terms regarding nutrients, making it even more difficult for them to understand the biological impact or importance of nutrition information (Hieke and Taylor, 2012). Consumers may even be unaware of food labels, and lack the knowledge about how they can be used to make more informed decisions about what food items to purchase (Swartz et al., 2011). A study of patients with chronic conditions (N=200) found almost eighty nine percent could not correctly use a nutrition label (Rothman, et. al, 2006).

Todd and Variyam (2008) found a significant decline in label use in their sample (N=8,768), and the decrease was greatest for twenty to twenty nine year olds, individuals without additional education past high school, and Spanish speakers.

Possible reasons for the decrease of label use by younger adults in particular include that they may have received less exposure, compared to older adults, to education surrounding label use that occurred during the passage of the NLEA (Todd and Variyam, 2008). As a result younger adults may have less knowledge or awareness about the importance and benefits of using food labels (Todd and Variyam, 2008). The lack of understanding of food labels, low levels of health literacy and poor knowledge about nutrition in general make it important to provide additional educational and interpretation aids, especially to understand misleading health claims on food items (Hieke and Taylor, 2012; Swartz et al., 2011). It is important to note however, that despite the majority of studies identifying poor nutrition knowledge as a factor contributing to poor label use, a few earlier studies found nutrition knowledge did not influence food label use (Nayga, 2000; Sapp, 1991). Food label formatting has also been found to be a deterrent to label use, and consumers prefer more graphic and colorful labels as opposed to the current quantitatively based labels (Silverglade and Heller, 2010; Drichoutis et. al., 2006).

Another factor contributing to low food label use is a lack of motivation or perceived importance of using food labels. There is a widening gap between knowledge of food and nutrition information and the motivation to actually use and act on nutrition information (Taylor and Wilkening, 2008). Low motivation to use food labels can stem from a lack of perceived importance of nutrition, distrust in the accuracy of nutrition information provided on the label, or resistance in accepting information consumers may feel is coercive (Cowburn and Stockley, 2005; Hieke and Taylor, 2012). Another factor influencing motivation to use food labels is a perceived lack of time to read and

use food labels when purchasing food (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Todd and Variyam, 2008).

Demographic factors related to label use include gender, age, education, and income, however research regarding these findings has been inconsistent (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Ollberding et. al, 2010; Todd and Variyam, 2008). Despite the inconsistencies, women seem to be more likely to use food labels than men and consumers with a greater understand of health and nutrition more often report higher levels of label use (Cowburn and Stockley, 2004; Drichoutis et. al., 2006; Guthrie et. al, 1995; Todd and Variyam, 2008;). Older adults also appear more likely to utilize labels than younger adults (Todd and Variyam, 2008). As previously mentioned, Todd and Variyam (2008) found 20-29 year old consumers were the main drivers of a decrease in label use. Individuals with higher levels of education were also more likely to use food labels (Todd and Variyam, 2008). However, studies have also found that higher levels of education can decrease consumers' motivation to use nutrition information provided on food labels due to a perception that their knowledge about food items is sufficient and they already know which items are healthy (Hieke and Taylor 2012; Moorman, 1990).

Eating Habits

The development of eating habits has been found by researchers to be related to physical and socio-economic factors, in addition to food practices of family members/caregivers and knowledge about nutrition (Kolodinsky, Harvey-Berino, Berlin, Johnson and Reynolds, 2007; Neumark-Sztainer, Story, Perry and Casey, 1999; Patrick and

Nicklas, 2005; Videon and Manning, 2003). Researchers have found eating habits of children are often influenced by environmental factors (Patrick and Nicklas, 2005). This includes the physical environment, such as whether or not foods are available and accessible, as well as socio economic and cultural factors such as economics, time restraints, and the eating habits and attitudes of parents (Patrick and Nicklas, 2005). In focus groups conducted with adolescents (N=141), researchers found that influence from parents and culture, time and convenience, perceived benefits and hunger cravings influenced eating decisions (Neumark-Sztainer, Story, Perry and Casey, 1999). Researchers also found parental presence during mealtime, in addition to whether or not adolescents watch television when eating meals, influence intake of fruits and vegetables (Boynton-Jarrett, Peterson, Wiecha, Sobol and Gortmaker, 2003; Videon and Manning, 2003). A study with college students eighteen to twenty four (N=546) found eating practices of childhood caregivers influence their current eating habits (Baranen, 1999). Knowledge of nutrition, in addition to specific knowledge about dietary guidelines related to whole grains, protein, dairy and fruit, has also been found to positively influence healthy eating habits (Kolodinsky, Harvey-Berino, Berlin, Johnson and Reynolds, 2007).

Current eating patterns of adolescents and young adults show intake of healthy foods such as fruits and vegetables do not meet recommended guidelines, and consumption of sugar, fat and sodium are exceeding recommended amounts (CDC, 2015; Dietary Guidelines Advisory Committee, 2010; USDA - Dietary Guidelines for Americans, 2010; USDA – What we Eat in America, 2010; Dietary Guidelines Advisory Committee, 2015). For children and adolescents in the United States, forty percent of their calorie intake includes empty calories from added sugar and solid fats (CDC, 2015; Reedy and Krebs-Smith, 2010). Approximately

half of this caloric intake comes from six categories of foods, “soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk” (CDC, 2015; Reedy and Krebs-Smith, 2010). Most youth in the United States do not consume the recommended amount of fruits and vegetables and whole grains each day and consume a high amount of sodium per day, much more than the recommended intake (CDC, 2015; Dietary Guidelines Advisory Committee, 2010; USDA - Dietary Guidelines for Americans, 2010; USDA – What we Eat in America, 2010). In the past few years vegetable intake for adolescents, and young adult males have continued to decline and although added sugar intake has decreased, it still exceeds the recommended amount (Dietary Guidelines Advisory Committee, 2015). Also, despite the importance of eating breakfast, young adults, aged twenty to twenty nine, and adolescents, are least likely to eat this meal (Dietary Guidelines Advisory Committee, 2015). Young adults are also the leading consumers of sugary beverages and they are specifically targeted in beverage marketing campaigns (Dietary Guidelines Advisory Committee, 2015). Thus, it is important to continue to promote healthy eating habits and the importance of nutrition to adolescents and young adults, and to equip them with tools enabling healthier eating decisions.

Food Label Use and College Students

Studies focusing on college students found food labels can be a useful tool in developing healthier eating habits and improve nutrition (Silverglade and Heller, 2010; Drichoutis et. al., 2006; Kim et. al, 2000; Taylor and Wilkening, 2008; Todd and Variyam, 2008). It is important to increase food label use in this group because many college students are making more decisions about the foods they eat, are living away from home for the first time, and because they are establishing eating habits that can

last a lifetime (Marietta et. al., 1999; Smith et. al, 2000). Increasing label use among college students is also important because, given their youth, many may not believe they are at risk of developing chronic conditions and thus have little motivation to use food label nutrition information (Smith et. al., 2000). Increased use of food labels can also decrease college students' consumption of unhealthy foods (Jasti and Kovacs, 2010). For example non-use of food labels and information about trans fats has been associated with a higher intake of fried foods (Jasti and Kovacs, 2010). Increased label use and healthier eating choices may lead to sustained healthy eating habits and a reduction in the risk of developing chronic health problems (Marietta et. al., 1999; Smith et. al., 2000).

Self-efficacy and health literacy have both been found to influence label use in young adults between the ages of eighteen and twenty nine (Cha et. al, 2009). A cross sectional study with a convenience sample of 1,294 college students found that food label users had more knowledge, more positive attitudes towards food labels, and more accurate perceptions of the relationship between diet and the disease (Raspberry et. al., 2007). About eighty five percent of participants claimed to look at food labels when buying food items (Raspberry et. al., 2007). Females were also more likely to use food labels and have more positive attitudes and knowledge than males (Raspberry et. al., 2007). Predictor variables of food label use included "health reasons, looking for specific nutrition information, weight control, and knowledge" (Raspberry et. al., 2007, p.79). Factors influencing infrequent food label use were time constraints, not caring, and the desire to just purchase the foods the participants wanted (Raspberry et. al., 2007).

Male college students seem to be more distrusting of label information, have lower levels of nutrition knowledge and food label reading behavior scores than college women (Misra, 2007; Smith et. al., 2000). Prior nutrition education is also an important factor that directly leads to increased knowledge about nutrition, and results in improved attitudes toward food labels (Misra, 2007). Misra (2007) found undergraduate college students had more favorable attitudes toward food labels and increased levels of nutrition label use than graduate students. A possible explanation for this is that a significant percentage of the graduate students were international students who may have had limited experience and knowledge about nutrition and food label use (Misra, 2007). In addition, Misra (2007) also suggested the undergraduate students in the sample received more nutrition education than the graduate students.

Food Label Education

Many researchers argue that in order for food labels to be effective, they must be accompanied by education on nutrition, as well as an explanation about how labels can be used to promote healthy diets (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Guthrie et. al, 1995; Smith, 2000; Taylor and Wilkening, 2008). Educators should emphasize that label use does not require extensive planning and they should promote the idea that label use can decrease the risk of chronic conditions such as obesity, high blood pressure and heart disease (Klopp, 1981). Despite the importance of supplemental food label and nutrition education, for most consumers, nutrition information provided on the food label is often their only source of nutrition information (Cowburn and Stockley, 2005). This makes it especially important that

consumers understand and use food label information when selecting food items (Cowburn and Stockley, 2005). In addition, although supplemental label education has been found by researchers to be important, there is little understanding about what education strategies and interventions may be effective in improving understanding of food labels and their use (Cowburn and Stockley, 2005).

Researchers specifically targeting college students' understanding of food labels argue that supplemental food label education is an important factor in increasing label use and label benefits (Marietta et. al, 1999; Misra, 2007). Marietta and colleagues (1999) found that food label education is associated with an increase in knowledge about food labels, more positive attitudes toward label use, and an increase in food label use by college students (Marietta et. al, 1999). Prior exposure to education on nutrition also directly increased college students' nutrition knowledge and improved attitudes toward food labels (Misra, 2007).

Knowing the benefits of supplemental nutrition and food label education, it is important we increase tailored educational interventions for young adults (Misra, 2007). Health educators and public health professionals should focus on tailoring nutrition and food label information, explaining difficult words and phrases on labels, increasing perceived credibility of nutrition claims, and educating college students on how to perform more complex food label tasks involving calculations such as computing fiber content (Marietta et. al, 1999; Misra, 2007). Jasti and Kovacs (2010) argued food label education and a focus on trans fat in particular, is needed for college students, especially high-risk groups (i.e. males and ethnic minorities).

Theoretical Constructs

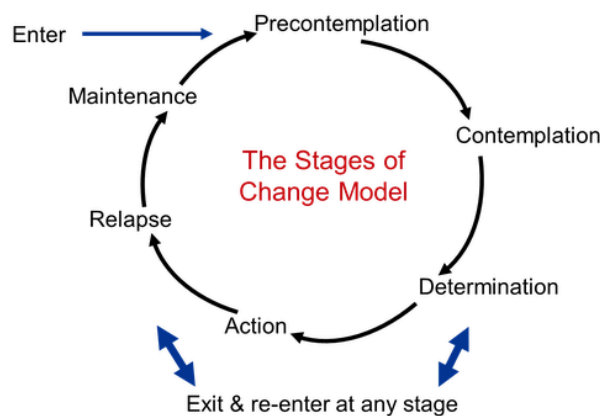
The interview guide and data analysis in this study were informed by three theoretical constructs, decisional balance and self-efficacy (from the Transtheoretical Model) and social norms. In the social norms approach, behavior can be influenced by “incorrect perceptions of how other members of our social groups think and act” (Berkowitz, 2004, p.5). Individuals can over or underestimate to what extent their peers engage in a certain behavior which can either encourage or discourage the individual to engage in the behavior her or himself (Berkowitz, 2004). Several studies focused on teenagers and young adults have validated these assumptions (Berkowitz, 2004). Research has also shown perceived norms can actually be more influential than actual norm (Berkowitz, 2004). Interventions using social norms “focus on peer influences, which have a greater impact on individual behavior than biological, personality, familial, religious, cultural and other influences” (Berkowitz & Perkins, 1986a; Berkowitz, 2004, p.5; Borsari & Carey, 2001; Kandel, 1985, and Perkins, 2002). As a result, addressing and correcting misperceptions of norms can be beneficial in improving attitudes and beliefs towards a behavior (Berkowitz, 2004). Again, the interview guide and data analysis in this study were informed by the social norms approach to understand what participants thought about how their friends and other college students use and think about food labels.

Transtheoretical Model

The Transtheoretical model, or the stages of change theory, provides a framework researchers can use to understand behavior change related to health (Armitage, 2004;

Prochaska and DiClementi, 1982). According to the model (Figure 3) there are five stages individuals go through before successfully making a behavior change: precontemplation, contemplation, preparation, action and maintenance (Prochaska, 2008; Prochaska, Redding and Evers, 2008). The precontemplation stage refers to when individuals are not thinking about engaging in a specific behavior and are not aware of the consequences of their actions (Prochaska et. al., 2008). Contemplation refers to when an individual is seriously considering behavior change, but has not yet taken any action (Prochaska et. al., 2008). Preparation is when an individual is preparing him or herself to make the behavior change (Prochaska et. al., 2008). The fourth stage, the action stage, is when an individual has successfully and consistently made the behavior change (Prochaska et. al., 2008). The final stage, maintenance, refers to when behavior change has occurred for six or more months (Prochaska et. al., 2008). In the Transtheoretical model, decisional balance, attitudes relating to the pros and cons of a specific behavior, and self-efficacy, a person’s confidence in her/his ability to engage in a specific behavior, are key predictors of stage transitions (Armitage, 2004; Prochaska et. al., 2008).

Figure 3: The Transtheoretical or Stages of Change Model



(Boston University School of Public Health, 2013)

The theory can also be used by researchers to examine three categories of individuals (Bridle et. al, 2005): those who have not decided to make a behavior change, those who have made a decision to change their behavior, and those who are already engaging in the new behavior (Bridle et. al, 2005). Interview questions were informed by both self efficacy and decisional balance to better understand attitudes and perceived benefits and challenges of food label use by college students, as well as whether they were able to understand and use labels effectively. This theory has been previously applied to examine food-purchasing behaviors (Henry et al., 2003) and was also used to develop the cognitive interview manual that was adapted for this study (Shafer and Lohse, 2005).

Chapter 3: Methods

Sampling

Data Collection

Data Analysis

Sampling

The sample population for this study was a purposive sample of college students, ages eighteen to twenty four, at a large east coast university. As previously mentioned, this study focuses on college students because of their overall poor nutrition, and given that they are in the process of establishing lifelong eating habits that can influence their risk of chronic health problems (Deshpande, D. Basil, and Z. Basil, 2009; Marietta et al., 1999). Following IRB approval (Appendix A), fifteen students were recruited, as previous studies using cognitive interviews to gather health related information have used a similar sample size (Carbone et. al, 2002; Damman et. al., 2009; FDA, 2011; Krall, 2010 and Murtagh et. al., 2007).

Interviews took place in two different conference rooms, based on availability, in the School of Public Health building campus. Recruitment began in June 1, 2015 and consisted of campus wide advertisements in the form of a flier (Appendix B) posted in areas of high human traffic and via email to all students on campus, through the campus listserv, "FYI" (Appendix C). An incentive to encourage participation consisted of twenty dollars in cash given to each student following completion of the interview. The flyer and listserv email included an email address and phone number for students to contact if they were interested in participating. Participants were screened for eligibility based on age (ages 18-24), student status (currently enrolled), willingness to be audio-recorded, academic level (in order to have at least three freshman, three sophomores, three juniors, three seniors and three graduate students) and gender (to ensure approximately half the participants are female, and the other half male). A tracking excel sheet was used to document recruitment information such as the date of initial

contact, participant ID number, certain demographic information and the date and time of the scheduled interview for each of the participants (Appendix D).

Data Collection

The in-depth interview items and script (Appendix E) was adapted from the FDA's 2008 Health and Diet Survey and manual titled "How to Conduct a Cognitive Interview- A Nutrition Education Example" that was created through the support of the USDA by researchers at Pennsylvania State University (Shafer and Lohse, 2005). This manual was chosen because it focused on nutrition education, which is related to healthy eating and food label use (Shafer and Lohse, 2005). The manual was also developed specifically for eighteen to twenty four year olds, making it applicable to college students (Shafer and Lohse, 2005).

Interview items primarily refer to the current food label format but also incorporate items regarding the new proposed food label to compare college students' perceptions regarding both food labels. The interview script introduction, warm up activities, probes and items one and twenty two (Appendix E) were adapted from the cognitive interviewing manual by Shafer and Lohse (2005). Questions two through twelve (Appendix E) were adapted from the FDA's 2008 national health and diet survey. Questions twenty three through twenty seven are demographic related questions. Question twenty seven on race and ethnicity includes responses from the Centers for Disease Control and Prevention's Demographic Data Guide (2014). Items nine and twenty nine include a skip pattern. The skip pattern ensured that the follow up interview questions was applicable to the participant. The interview questions and

script were pilot tested in the month of May using a convenience sample of three individuals, two females and one male, between the ages of eighteen and twenty four to ensure the interview warm up, script and questions were understandable, appropriate and effective.

All interviewee responses in this study were kept confidential and although the interviewer was aware of the identity of the interviewees, names and specific identifying information was not collected or included in the transcripts, data analysis or research paper. Each transcript was be labeled with an identification number (1-15) and the only information about the participant included on each transcript was the participant's age, academic level, gender and ethnicity. Participants were given an informed consent form to sign (Appendix F) and told the details and purpose of the study. They were also told they could skip questions they did not feel comfortable answering and could stop the interview at any time. In addition, participants received the contact information of the interviewer in case they had any additional questions or comments regarding the study once they completed the interview. Prior to asking the interview questions, participants took part in a warm up activity to get them comfortable with openly sharing their thoughts and feelings (Shafer and Lohse, 2005). In addition to the interview guide questions, the interviewer used probing statements and questions used in the cognitive interviewing manual by Shafer and Lohse (2005), such as "what thoughts are going through your mind right now?" or "what other thoughts come to mind that you haven't shared?" to facilitate a productive interview session.

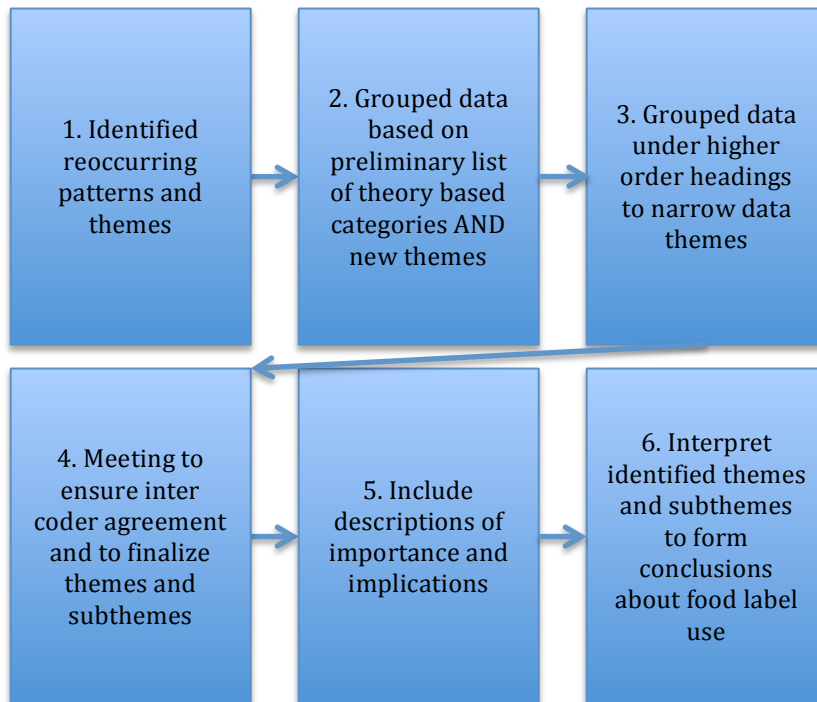
Data Analysis

Interviews were audio recorded using an iPhone, with the permission of each participant, and transcribed. With qualitative data analysis the purpose is often to identify themes or categories within the interview data, that can help the researcher understand the social reality in a particular setting related to identified themes (Zhang and Wildemuth, 2009). Qualitative data can also be used to provide more detailed insight into complex issues (Creswell, 2007). Data analysis in this study was informed by constructs from the Grounded Theory Model, the Transtheoretical Model and the social norms approach (Glaser and Strauss, 1967). The Grounded Theory Model is founded on a process of data analysis that uses inductive reasoning in order to generate understandings about the perceptions of study participants by reading closely through interview content and identifying themes and subthemes that can lead to the development of hypotheses (Glaser and Strauss, 1967). Theoretical constructs were used to create a starting list of categories and themes to look for, including decisional balance about food labels, decisional balance, including motivations and benefits of label use and barriers to food label use, intentions to use food labels, self-efficacy and social norms (Appendix G; Miles and Huberman, 1994; Zhang and Wildemuth, 2009). Through identifying salient themes and interpreting the qualitative interview data in this study, we gained a better understanding of what factors influence college students' label use and how.

Once the interviews were transcribed, responses to each question were compiled and an inductive approach was used to identify reoccurring patterns and themes in the

transcriptions (Appendix H). When reviewing the interview transcripts the researcher focused on understanding participants’ meanings” related to food label use (Creswell, 2007, p.39). The responses to each question were reviewed thoroughly to identify reoccurring common themes. The researcher had a preliminary list of theory constructs that were supplemented with additional themes as new ideas emerged through inductive analysis (Appendix G and ; Miles and Huberman, 1994; Zhang and Wildemuth, 2009). Following the first identification of common themes, similar categories were grouped together in a database under “higher order headings” to reduce the number of themes (Appendix I; Elo and Kyngas, 2007; McCain, 1998; Burnard, 1991). Through this method of content analysis the words of the interview participants were interpreted into fewer related categories and themes based on interview content (Elo and Kyngas, 2007)

Figure 4: Inductive Data Analysis Procedures



When analyzing qualitative data, reliability is often confirmed using inter-coder agreement through analyzes of interview transcripts by multiple researchers (Creswell, 2007). To confirm reliability of the data analysis for this study, a graduate student familiar with qualitative analyses was recruited. The student was provided with a sample of the interview transcripts, a little over ten percent, recommended by some researchers as a sufficient sample to determine inter coder reliability (Hodson, 1999), to independently identify themes and subthemes. Next, a meeting was held between both researchers to discuss the sample of transcripts and independently identified themes to come to an agreement on the themes that were salient and meaningful. The researchers had over eighty percent agreement with the initial themes they identified, and during the meeting came to almost one hundred percent consensus on the salient themes relating to the sample transcripts. Following this meeting, themes and subthemes were finalized.

Due to the scope of this study, two out of seven of the most salient themes in the interview transcripts, norms and self-efficacy, were chosen to be further analyzed in an in depth manner. Final identified themes and subthemes were then interpreted to develop conclusions about college students' perceptions related to food label use, as well as factors that inhibit or motivate increased use. Lastly, data findings were interpreted to form recommendations that may be useful for future public health interventions related to food label education for college students.

Chapter 4: Results

Participants

Findings:

Social norms

Understanding Food Labels and Self-Efficacy

Label Use

Decisional Balance

Current Food Label Content

New Food Label

Food Label Education

Participants

Interviews took place from June 24, 2015 through September 18, 2015. Eight participants were males and seven were female. Each academic level (freshman, sophomore, junior, senior and graduate student) was represented via three participants each. Participants came from various academic departments and majors including math, psychology, chemical engineering, journalism, engineering and arts and humanities. In terms of ethnicity, six participants identified as white, four as African American, three as Asian, and two as Hispanic or Latino; participants were between the ages of eighteen and twenty-four.

Findings

After exploring responses to the four research questions, seven primary themes (Table 1), and several sub-themes, emerged (Table 2). Social norms and self-efficacy appear to be the most salient and important themes identified in this study; five additional themes were identified and will be briefly summarized, including: behaviors associated with label use, positive and negative attitudes towards label use, perceptions related to the content of the current food label, perceptions regarding the new proposed food label, and recommendations for future food label education (Table 1). Again, theoretical model constructs explored through participant responses included self-efficacy, decisional balance and social norms.

Table 1: Primary Themes

Primary themes						
1	2	3	4	5	6	7
Social norms	Self-efficacy	Behaviors associated with label use	Positive and negative attitudes towards label use	Perceptions related to the content of the current food label	Perceptions on the new proposed food label	Recommendations for future food label education

Table 2: Salient Themes and Subthemes for Norms and Self-efficacy

Theme	Subthemes							
Social norms	Low use of labels	Label use are for: A. losing weight, B. older individuals, and C. athletes	Stigma	They don't care	Inconvenient and take too much time	Financial restraints	They don't know	Limited availability of food labels
Self-efficacy	Difficulty with serving size	Difficulty with percent daily value	Difficulty with ingredients	Labels are confusing and difficult to understand				

Social Norms

Participants were asked if they thought other college students used food labels, and what they thought their friends and other college students' general perceptions were regarding using food labels. Several sub-themes related to social norms on food label use emerged and responses indicated that in general college students hold fairly negative attitudes towards label use.

1. Low Use of Labels by College Students and Friends

Despite half the participants expressing they personally use food labels (N=8), many also thought food label use by their friends and other college students was fairly low. Specifically, three people thought college students used food labels to decide what

foods to *eat*, five stated other college students do not use them, while other responses included “it depends,” or “hope so.” When asked whether college students use food labels to decide what foods to *purchase*, four said “yes,” four said they do not use them, and others responded “sometimes” or “maybe.”

2. Label Use is for Losing Weight, Older Individuals, and Athletes

Many participants shared that other college students and their friends feel they do not need to be concerned with food labels, as they are not necessarily applicable or useful to them. It seems in their social environment label use is seen as mostly beneficial to and used by people who are trying to lose weight or concerned about their body image (N=10). Several participants also stated they are too young to worry about using food labels (N=4), and that food labels are mostly used by, or perceived to be useful to, athletes or “active” students (N=4).

Label Use: Losing Weight

Throughout the study food label use was often mentioned as being associated with the desire to lose weight. Three young women described the people around them using food labels because of body image issues and pressures to be skinny. A female freshman shared how food labels can be used as a tool to limit food intake, particularly for women. She said, “like there's more pressure - maybe there isn't but I feel like there's more pressure on females to like be more skinny I guess and like food labels help in a sense of like not eating too much.” A female junior also shared, “so I would say the body image influences food label use, if you wanted a really hot body you would be more inclined to

focus on what's in your food, as opposed to not being all that obsessed with your looks I suppose.”

Four participants described that their friends (and other college students) think food labels are mostly useful to people who are trying to lose weight, or worried about gaining the ‘freshman fifteen.’ They seemed to believe if a person is not trying to lose weight, then using food labels is not necessary or a concern. When asked about other college students perception’s regarding food labels, one male graduate student responded, “that it's useful but really only necessary if you have a particular diet. Well cause I know for people like myself who don't generally have to worry about their weight.” One male freshman shared he thought all college students use food labels “cause all of them want to avoid the freshman fifteen.”

Another shared,

“If you're fine with your body weight and everything else, it's not really gonna matter, but if it's an actual concern for you and you want to try to lose weight or go on a diet or do whatever else, then you're gonna care about food labels to know exactly what you're putting in your body.” – Male freshman

Label Use: Too Young to Worry

Another reoccurring sub-theme that came up as part of “social norms” had to do with other college students believing they are too young to worry about using food labels (N=4). A male freshman participant shared students have other priorities but will pay attention to labels once they get older and have kids, and a female sophomore participant shared similar sentiments. She shared her friends’ think they are too young to worry

about using food labels, and they will do so when they are older. She said, “as we grow older and as we need to start worrying about our health and like our cholesterol then that's when we will start paying more attention.”

Two participants shared college students are at the time in their lives when they have just left their families and have the mentality, “we want to do whatever we want.” Their responses imply college students want to eat whatever they want without worrying about looking at food labels.

“We're generally more active so I think food labels is more for you know like older people, or like mothers - for their kids. But, you know like college students, we just got out of like our family and we want to eat whatever we want.” - Female Sophomore

“My perception is just that um at this point in our lives we're not that concerned with our health as we should be, so it's kind of like a Russian roulette type thing. We're just gonna take the shot here and eat whatever we want when we feel like it.” - Female Junior

Two participants discussed how other college students have fast metabolisms, one specified males in particular, which results in them not needing to care about using food labels. A female freshman shared, “guys tend to have - or at least my friends that are guys - tend to have much higher metabolisms so they can like eat whatever and be fine.” Feelings of being youthful, not needing to care or worry about health problems, the desire

to “do what we want” and the thought that college students have fast metabolisms were perceptions provided by study participants that may be potential deterrents to food label use in this population.

Label Use: Athletes and Active Students

Several participants stated food labels are mostly used by or useful to athletes or “active” students (N=4). For example, a male senior participant, when asked if he thought other college students use foods labels, shared “probably mostly like athletes and stuff. They probably use them, especially the wrestlers and stuff like that. But mostly athletes and probably, I don’t know I guess if you were like on a diet or trying to gain weight or something like that” Another male graduate student shared that active students, and specifically most of his friends “who lift,” use food labels more than other college students because they have more awareness about the foods they consume and “are on a regimen or are trying to augment their program.”

3. Stigma

Four participants shared responses that portray a possible social stigma related to food label use. Participants mentioned potentially negative words either they used to describe food label users, or that others would think about them for using food labels (N=4). One participant, a male junior, shared that his friends make fun of him when he looks at labels, “they ask ‘why do you care?’ and assume the only reason you would be using food labels is to count calories and lose weight.” He also said,

“Yeah, I guess that it's not normal at least to just sit there looking at food labels, it's abnormal. Uh it's abnormal, it's like - but like perhaps in a slightly negative way like it's kinda like strange almost.”

Another participant shared using food labels can be embarrassing for her:

“... I guess there's kind of stigma, like if you're like with someone it's kind of weird if you like grab what you're eating and just like kind of look down and read the food label and so like you might be embarrassed or like reluctant when you're in front of other people.” - Female Freshman

One participant believed it was a matter of two extremes—he said half of his friends think “uh whatever, I'm just going to eat this, my metabolism is alright, so it's going to be ok,” and the other half are “anal” about using food labels. Another participant, a female sophomore shared her closest friends who are “hippies” and into “all the other buzzwords that everybody's into right now,” use labels. Although “hippies” is not necessarily a negative term, it could potentially portray a perception that “normal” or “regular” college students are not necessarily food label users, and those who are tend to be “anal” about things, or “hippies” who are into the latest trend.

4. They Don't Care

The sentiment that other college students do not care about food labels and they are not perceived as important was shared by one third of the participants (N=5).

A male senior discussed how some people don't "give a crap" about using food labels because they "know" they can just be healthy by buying vegetables "half the time," or go to Chipotle for "fresher" foods. A female junior shared people are "lazy" and even though they know food labels could be important "they just don't care enough." A female sophomore mentioned, "every one knows that it's there and they know that it could be beneficial to look at, but I don't think anyone is—I guess really cares about like making like a really informed decision." A male freshman also shared that others think using food labels is not necessary "because like our bodies should naturally be able to like tell us what to eat I guess." In addition, and as previously mentioned, a few participants shared if a person does not need to worry about losing weight, food labels are not necessarily something they care about using.

5. Food Labels are Inconvenient and Take too Much Time

Participants also shared others think looking at food labels can be inconvenient, and take too much effort and time (N=6). Four described that other college students find food labels to be a hassle or inconvenient. A female graduate student thought others don't use food labels because "I think they feel like it's like kind of doing too much." Another student, a female freshman shared, "I guess it's kind of a hassle to just like—it takes time to look through it and understand it and make judgments about it where like if you wanna eat you just kind of want to grab something."

Five participants shared college students are often in a rush or "on the go," making it more difficult for them to use, or want to use, food labels. For example a participant said:

”... this kind of is an urban environment, it's very quick paced. I think they would still purchase their favorite bags of chips or coke on the go. You know because it's probably not the end of the world if they get one snack. So they'll still purchase it anyways even if it's not the best healthiest food.” - Male Senior

6. Financial Restraints

Another recurring concept that emerged was college students often feel financial constraints (N=5). Three participants shared college students are often on a budget and more likely to choose the cheaper food item over the healthiest option, making food labels less useful to examine. When asked if he thought if other college students use food labels a male senior shared, “I mean some of them do but I know a lot of people are constantly like on a budget and stuff or they like really don’t have that much money so they just get the cheapest thing.”

A female junior shared that college students don’t really use food labels because their bigger concern is having something to eat. She said college students are “just making sure you have something to eat and if it's not all that healthy, tough luck, because sometimes you don't know when you're next meal is coming, so you have to be aware of all that.” A male sophomore also shared sentiments of wanting to “survive” and explained, “other people are just like ‘I don't care I don't want to look at it - I just want to survive and get through life’ and you know I think that they would just you know eat their cup of Ramen and not care how bad it is for you.”

7. *They Don't Know*

The issue of other college students “not knowing” or having difficulty understanding food labels and why they are important was also brought up (N=3). A female graduate student shared her friends don't know how to read food labels, don't know “what to look for” and are often misled by packaging information. She explained,

“It might be lack of education. It's also you're coming into a new environment and previously maybe your parents put all the food on the table and that's - and they did all the shopping and that's kind of how it was and so there is no ownership now of what you're eating.”

Another participant, a male senior, shared the only people who use labels do so to follow fads, like being gluten free, without necessarily understanding the term. He explained,

“... always wanting to know if something is gluten free, I'm sure they don't even know what that word even means. Um, but that's probably the only thing they look on the food label. There's always these kind of health fads about you know.”

8. *Limited Availability of Food Labels*

Limited availability of food labels in dining halls, limited options for purchasing food items or groceries and college students not cooking often are other factors participants described that make it more challenging for college students to use food labels. (N=6). One participant shared college students (younger college students in

particular) are more likely to be on a dining plan and not need to purchase food items. A female sophomore shared, “either it's just like the diner or like one of the convenience stores so it's not like a whole grocery store where you have like many options. So it's kind of just getting what's easiest, what's convenient.” A male freshman agreed and stated college students don't need to purchase “real food” because that is included in dining plans, and when students are purchasing foods it would be mainly for snack items. He also stated he didn't think students would use food labels when purchasing snack items.

Understanding Food Labels and Self-Efficacy

When asked if participants understood all of the information provided on nutrition labels, about half (N=8) said they do while seven said they do not. Participants thought food labels were confusing, hard to read, unintuitive and that there were discrepancies in information provided. There also seemed to be major challenges understanding and interpreting serving size, percent daily value and ingredients.

Difficulty with Serving Size

The most mentioned problem associated with understanding the current food label was difficulty interpreting the serving size, which was brought up by nine participants (N=9). They particularly had difficulty interpreting units of measurement, and understanding the serving size when what is displayed on the food label is not the serving size in the whole container. A male senior discussed how he did not understand how much a “cup” of food would be. He said, “if you just say cup or bowl, your gonna be like ‘ok what kind of bowl? What kind of cup?’” A female graduate student shared, “I think

the serving size can be difficult to understand if you're not familiar with weighing your food or—especially too when they provide serving sizes in weights instead of cups, I think that can be really confusing.” A male junior expressed difficulty understanding how much a gram of food would be. He explained, “sometimes the serving size is weird” and he sometimes “needs” and “wants” additional and “clearer” information about the serving size. A graduate student participant shared his confusion with interpreting units of measurement results in him ignoring the rest of the food label,

“there are some food labels that I do look at but then there's just –some of them are more—especially if the serving size is just way more confusing than they have to be. They'd give like a weight like 5 grams, and I have no idea what 5 grams of whatever it is so. To me I just look at that and well think "well this is useless" and I don't look at the rest of it and give up on the label.” - Male Graduate Student

The issue that the serving size displayed on food labels often does not include the entire container was also brought up. One participant shared,

“Yeah the first thing that my eyes go to is the serving size and servings per container. Um, this information has kind of always confused me honestly. I know that it's kind of like misleading considering like the serving size and it isn't exactly what is presented in the product, but hey that's what's usually on them. I don't think that's right, but hey.” - Female Junior

Difficulty with Percent Daily Value

The second most mentioned problem with understanding food labels was difficulty understanding the percent daily value (N=6). A female graduate student discussed how interpreting daily value percentages depend on a person's "cognitive ability." She also shared a lot of people do not understand that percentages provided on food labels are based on a diet of two thousand calories. Another female, a junior, shared the most difficult part of the label for her is the percent daily value and she does not understand the baselines or "unit of measure" used for the percent daily value. A male senior stated he would like an explanation, in "layman's terms," of the meaning of the percent daily values. He said,

"Because one—I don't really know, and I'm probably not a doctor myself, I don't know what these percentages and milligrams are and I'm just like don't even care. I don't even know how much I actually need to consume. That would be nice to know. And I know not everyone—bodies work differently. So, some people may need more or less protein, more or less sugars, and diabetes, and that's one thing that I think the problem with food labels are is no one knows how much to consume, or their limit. Um and then that's just part of the 'so what?' about it."

Difficulty with Ingredients

The third most mentioned part of the food label participants had difficulty with was the food label ingredients, mentioned by four participants. (N=4). A female graduate student participant said one thing that would help her better understand the food label "would be making the ingredient list, digestible." A senior mentioned the most

challenging part of the food label for him to understand was the ingredient list. He said, “I really wish, like I said, there was a scanner so I could know what that meant, even if it was a really laymen definition.” Another participant shared “even as a scientist, the ingredients are just unknown, like well I have no idea what that is. Doesn't mean anything to me.”

Labels are Confusing and Difficult to Understand

Five participants expressed food labels can be confusing (N=5). Specific issues people discussed were: labels can sometimes be misleading and include discrepancies with information; they can be hard to read, sometimes due to a font size that is too small; labels are not intuitive; and participants sometimes have difficulty understanding the meaning of certain nutrition facts. A male graduate student discussed having difficulty with “discrepancies where they are listed like itemized under say total fat or total carbohydrates where there's one or two things listed but the - those - that list doesn't add up to the whole, so it's not as intuitive to know what is making up the rest of that whole.” A male senior alluded to feeling misled by food label information. He said, “there's an attitude that the people, with exceptional cases of things that are very truly like natural and that sort of thing, where it only has like two ingredients in it, there's this like cultural recognition that the person putting the label on things is likely trying to deceive you.”

Another participant shared the print size and font is sometimes so small that she thinks “um I don't think I'm gonna really take the time to squint and look at this.” She also shared difficulty with the coloring of the food label and said,

“If the color they choose isn't really - a really good contrast then I'm not really going to take the time to read it. Like not all the food labels are you know just black on white, you know sometimes it's like a really pale color against something and I'm like "um yeah I see how you wanted to stick to the color scheme, but again I'm not going to take the time to read it. So yeah.” - Female Junior

One male participant shared the middle section of the food label, the section that most grabs his attention, can be overwhelming and difficult to understand, “...the middle part is also the scariest part. Because there's you know - there's just so much information there. Especially on like - especially on some food labels that like are like (stretches arms) this long cause they have like so much information on em...” Another male student, a senior, shared “well some things I think the way they communicate is just unintuitive.” For example, he shared he has difficulty interpreting the grams of sugar displayed on food labels. He specified that for food items such as a fruit juice, he does not know how many of the grams listed are from natural fruit and how much of it is added.

Label Use

Food label use among study participants was about evenly split. When asked “*Do you use food labels to help you decide which particular food items to buy or eat?*” eight participants said they do, seven out of the eight said using food labels was routine or habitual for them and five said they do not use food labels. For example, when asked if he used food labels a male freshman said,

“um not really cause I'm currently not really at the stage of being concerned about my overall health and wellness. Where I feel like ‘ooh too many calories in a meal.’ Cause like I'm walking a lot going around on campus. As far as I can tell I have a pretty decent metabolism so food labels aren't really a huge concern for either convincing me to get a food because it's healthy or convincing me to not get a food because it's unhealthy.”

A female graduate student responded that she did use food labels and shared,

“Definitely. Um, I eat a lot of fruits and vegetables, so for those foods labels aren't really there, but in the grocery store I'm definitely looking at the food labels, especially if there's an option. Um, so for instance, ice cream, always looking for the lower fat or no fat. Um, ice cream, especially the sodium that's something that I personally look at a lot cause I try to cut that out.”

Nine stated they could think of an instance in the past two weeks when they looked at a food label and it influenced their decision to buy or eat something.

Most people, even those who said they usually do not use food labels, responded they do use labels when looking at a food item for the first time (N=11), when comparing items (N=12), to check if something said in advertising is true (N=9), to find out nutritional content and for meal planning (N=12). Although about half of the participants reported label use in general, it seems when asked more specifically about label use, such as if they used them to compare different food items together, a greater number actually used them.

The majority of participants (N=11), intend to use food labels more in the future for a variety of reasons—going on a diet or trying to lose weight (N=3), to stay fit or when they begin to exercise more (N=2), and for prevention of health problems (N=2). In terms of demographics, participants who said food label use was a habit for them and part of their general routine (N=7), most were upper classman and graduate students. Only one freshman, a female, said label use was a habit for her, and no sophomore reported food label use was part of her/his routine.

Decisional Balance

Positive: Benefits and Motivators

Most participants (N=11) think food labels can help people make healthy decisions. Perceived benefits of and motivators for using food labels included using food labels to help with shopping or making food choices (N=11), investigating misleading nutrition information or information they don't trust (N=10), to lose weight and for dieting reasons (N=8), seeking awareness of what is in the food they are eating (N=8), for better nutrition (N=5); family related reasons, such as family members using food labels because of allergies, having health problems or being health conscious (N=4), and lastly, for general health (N=2). When talking about the benefits of using food labels a female senior shared,

“...that's how I make my healthy decisions so. Well I just feel like if you're looking at the food labels and you kind of know what you're putting into your body like it can definitely help - like of course you have to know what is healthy and what isn't. So, for example, like um if you think you're only supposed to be

eating like a thousand calories a day and then you look at the food label, that could be unhealthy, cause it's too few calories. But, if you know what's healthy and then you look at the food label, it should help yeah."

When asked if he thought labels could help people make healthier decisions a male senior said,

"Yes. Um, well I - uhh, definitely looking and what goes into food I think, is helpful. Cause you get a sense of like how natural or unnatural it is. Um, I think a lot of food, just looking at like how much sodium or salt goes into it. Like things you wouldn't taste, or you wouldn't know to look at, but certainly make big deciding factors about how healthy something is."

Negative: Additional Barriers

Factors participants believe prevent them from using food labels, or make them more challenging to use, include: feeling they just don't care and don't want to use them (N=8); a lack of concern, and feeling that looking at the label is just something they don't "need to do" (N=6); feeling it is easier to ignore the food labels (N=4), wanting to ignore the label to avoid feeling guilty about what they were about to eat and feeling sometimes they "just want to eat" without worrying about the nutritional quality of the food (N=3). In addition, comments related to the actual food labels were brought up as barriers. These included labels being hard to read or understand (N=6), a mistrust of food label information, how sometimes the information on food labels can be misleading (N=5), a lack of time to look at the label (N=4), and financial barriers (i.e. students sometimes having to select the cheapest item, regardless of whether or not it is healthy) (N=3).

When asked about what reasons prevent her from using food labels a female graduate student shared,

“so when you want something badly and you just don’t care of the content. A lot of times - I try not to do this - but I have friends who are just. "I've had a bad day, I need a pint of ice cream and it doesn't matter what's in it." Um, hmmm what else? I think it's mostly just trying to stay ignorant of what's in there.”

Current Food Label Content

In addition to the issues discussed in the self-efficacy section about how the current food label is difficult to understand, comments were made related to the content provided on food labels. Twelve participants said the interview handout of the current food label was informative, no one said it was not (Figure 5). When asked if the handout of a current food label was informative, a male sophomore shared,

“um, I would say that it is. You know, it's relatively informative. I don’t know what like - you said earlier that there's a new one, so I don't know what that one looks like and I guess I will soon enough. But you know what, it gives you like well here's you know, here's the fats, like all the - it gives you like in the grams, milligrams, and it gives you the serving size and how many servings there are and what you're getting out of an entire serving. You know, it's all there.”

Components of the food label that most capture people’s attention is the calories (N=7), fat (N=7), sugar (N=5) and ingredients (N=4) information provided. It is interesting to note that daily percent value and serving sizes were the components least mentioned as

seizing participants' attention and are also the components participants thought were most difficult to understand.

New Food Label

Most participants thought the new proposed label was easier to understand and read than the current food label (N=13) while three individuals thought it was not much different from the current food label. In addition, eight participants said they were more likely to use the new food label when compared to the current food label (N=8); four stated they do not think they are any more likely to use the new food label than the current version.

Eleven participants identified positive elements of the new food label they liked or considered to be improvements. The new presentation of the percent daily value (N=5) and the new serving size format (N=4) were most noted as improvements. Eight others commented on positive aspects of the new food label such as it being “appealing to the eye,” “bolder,” “clearer,” “organized”, “more streamlined” etc. Six participants also noted the new food label puts a significant emphasis on the calories section. A female senior who said she was more likely to use the new label said,

“Yeah, definitely. Cause it's just easier to read like I was saying before like no one likes to read food labels cause they feel like it's a hassle, so if it's bolded, like big, like 230 calories, then you're more likely to see it and read it and comprehend it, yeah.”

A male senior who was not more likely to use the new label compared to the old one

shared, “I don't think there's really a difference. About other than it's a little more

condensed and organized. But there's a lot of so what questions I have like. What does this even mean? For me."

Food Label Education

Five participants mentioned they received prior nutrition or food label education. The most popular suggestions on venues for future food label education programs (focused on college students) included hosting programs at facilities that offer food items such as the school dining hall (N=4) and grocery stores (N=3), as well as online (N=5) information. It is important to note, however, two participants specifically mentioned not having an on-line educational program on food labels because they believed college students might not take it seriously or actually complete it. The most suggested method for food label education programs was in a classroom setting (N=7) and three participants mentioned food label education should be provided early on in their lives. Other suggestions included having booths around campus (N=2), teaching people during college orientation (N=2), creating an educational video (N=2) or having something at a popular high traffic location on campus, specifically the Stamp/ Student Union (N=2).

Most common suggestions for what future food label education programs should offer or teach participants included teaching people about the importance of using food labels (N=4), teaching them "how" to do label related tasks, such as how to shop, and how to read and interpret food labels (N=5). Explaining food label components, providing definitions, explaining what people should look for and why certain things are "bad" for you, and what nutrients are (N=6) were also mentioned. For example, a male freshman shared,

“you sort of have to convince them to care about what's on the food labels, rather than the food labels itself. Cause you have to sort of like tell them like - like I said earlier, explain exactly what cholesterol is, explain exactly what a calorie is and explain why that's important to them and their body. And then they'll look at food labels as like 'oh I gotta know what's in this cause cholesterol is gonna be really bad if I have too much'”

Lastly, four participants thought food label education programs should offer a financial incentive to participants (N=4).

Chapter 5: Discussion

Discussion

Conclusion and Recommendations

Strengths and Limitations

Discussion

Motivation to Use Food Labels

Overall participants in this study believed college students are not motivated to use food labels. They shared perceptions that they as well as their friends and other college students do not care about food labels, which is surprising given half stated they do use them. Participants also shared that their friends and other college students do not find food labels to be applicable to them, or important. This could continue to be a major barrier in label use despite upcoming changes in the new food label. Lack of motivation and lack of perceived importance were also noted by researchers as factors that influence low label use (Cowburn and Stockley, 2005; Hieke and Taylor, 2012; Taylor and Wilkening, 2008). Raspberry et. al. also found (2007) college students felt they do not care about food labels and just want to purchase the foods they want to eat.

Participants in this study also show a lack of perceived risk to developing chronic conditions, and little motivation to use labels. Not one participant in this study mentioned that food label use at their current age could help prevent them from developing chronic conditions, although two did mention they plan to use food labels in the future to prevent health problems. Smith et al. (2000) argued increasing label use among college students is important because, given their youth, many may not believe they are at risk of developing chronic conditions and thus have little motivation to use the nutrition information. Participant responses confirm the notion that at this point in their lives it does not appear college students feel susceptible to developing chronic diseases but that rather these health problems are issues they may have to address far off in the future.

Perhaps future food label education programs should emphasize that increased label use and healthier eating choices may lead to sustained healthy eating habits and a reduction in the risk of developing chronic health problems (Marietta et. al., 1999; Smith et. al., 2000). It may be important to address that although chronic diseases are issues individuals may not face until the future, it is often poor eating habits developed early on that lead to poor nutrition and increased risk of chronic disease (Marietta et. al., 1999; Smith et. al, 2000). Alternatively, since college students are not yet concerned or worried about developing chronic conditions, future education programs may want to shift the emphasis to how healthy eating is relevant to their lives in their youth, and that better nutrition can keep them healthy and help them feel better at their current age.

Three concepts associated with “social norms” that emerged in this study (labels being useful for individuals trying to lose weight, more important for older individuals, and mostly used by athletes) convey the notion that perhaps food labels are not perceived to be a useful tool for young and “regular” college students. Raspberry and colleagues also found weight control to be a predictor valuable for food label use (2007). Stigma and negative terms used to describe people who do use food labels may further promote an attitude that label use is not an important habit for “regular” students. Stigma around food label use may potentially lead students to worry about the risk of being caught looking at a food label. They might think the benefits of having nutritional information about the food they are eating is not worth feeling embarrassed. Addressing misconceptions about who should use food labels, and that it is not only a useful tool for older individuals, athletes and people trying to lose weight, might alleviate some of the stigma and negative perceptions towards food label use. According to the social norms

approach, addressing these negative social norms could potentially improve attitudes towards food label use and promote label use (Berkowitz, 2004). Thus it may be beneficial for educational campaigns to not only promote food label use as being an important health tool for all college students, but also that it is not “strange” or “abnormal” to look at labels.

Other Barriers to Label Use

Another factor that likely influences motivation to use food labels is perceived lack of time to read and use food labels when purchasing food (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Raspberry et. al., 2007; Todd and Variyam, 2008). Lack of time was mentioned by several participants in this study as a reason that prevented them from using food labels. In addition, six participants discussed how their friends or other college students believe using food labels can take too much effort and time, and that college students are often in a “rush” or “on the go” making use of food labels more difficult. Today’s students, Generation Y, are thought to have shorter attention spans, less patience for “step by step instructions or thinking,” which might contribute to thoughts that looking at food labels takes too long, despite it being a fairly quick activity (Black, 2010).

Other barriers discussed preventing these participants and other college students from using food labels included financial restraints and the limited availability of food labels on college campuses. It may be important to consider evaluating food items offered on college campuses to assure students have available and affordable healthy options and that foods offered in dining halls have easily accessible food label information.

Poor label content and formatting (on the current food label) was also found to be a deterrent to food label use (Silverglade and Heller, 2010; Drichoutis et. al., 2006). According to the Transtheoretical Model, decisional balance, the perceived pro's and con's of engaging in a particular behavior, is a key predictor of behavior change, making it important to address these perceived con's of food label use and to promote more positive attitudes about the benefits of it (Armitage, 2004; Prochaska et. al., 2008). Overall however, the majority of participants in this study seemed to react positively to the content and formatting of the new food labels, which could potentially motivate future label use.

Food Label Use and Demographics

Researchers have found women seem to be more likely to use food labels than men (Cowburn and Stockley, 2004; Drichoutis et. al., 2006; Guthrie et. al, 1995; Todd and Variyam, 2008;). However, of the seven participants in this study who found label use to be part of their general routine (i.e. a habit), four were men, and three were women. This is a qualitative study with a very small sample size (N=15), but it is interesting to note they were almost evenly divided.

A surprising finding in this study was although half of the participants reported using food labels, the majority expressed most college students and their friends, in general, do not use food labels and do not care about them. This may be a result of over-reporting or that students willing to participate were already interested in food labels or aware of their benefits. There is also the possibility that when asked about how other college students used food labels, participants felt more comfortable sharing their true

feelings about them. The principal investigator noted that often when responding to questions about other college students, participants seemed to express their own personal negative feelings towards food labels as well. It is possible participants feel some of the sentiments they shared about their fellow classmates.

Self-Efficacy and Food Label Education

Several researchers have suggested that for food labels to be effective, they must be accompanied by education on nutrition, as well as an explanation about how labels can be used to promote healthy diets (Cowburn and Stockley, 2005; Drichoutis et. al., 2006; Guthrie et. al, 1995; Smith, 2000; Taylor and Wilkening, 2008). Other researchers who specifically target college students and their understanding of food labels, argue that supplemental food label education is an important factor in increasing label use and label benefits (Marietta et. al, 1999; Misra, 2007). Participants in this study reported difficulty understanding and interpreting elements of the current food label. Only half felt they understood all information provided, indicating there is likely a need for greater education on how to understand and interpret elements of a food label, such as percent daily value. Although some of the issues participants described, such as the depiction of serving size and specifying natural and added sugars are being resolved with the new food label, other problems such as understanding how to interpret percent daily value, small font size and a mistrust of information may continue to influence self-efficacy, a key predictor of behavior change according to the Transtheoretical Model, and thus may inhibit food label use (Armitage, 2004; Prochaska et. al., 2008).

Mariette et. al. (1999) and Misra (2007) argue that when providing nutrition and food label information, health educators should explain difficult words and phrases on labels, increase perceived credibility of nutrition claims, and educate college students on how to perform more complex food label tasks involving calculations such as computing fiber content. Participants in this study had particular difficulty understanding and interpreting percent daily value and serving size information, endorsing the importance of providing education on food label tasks involving calculations. Addressing challenges related to self-efficacy through food label education is vital to promoting food label use, as intention to actually use food labels will only be translated into behavior if the individual believes he/she is capable of successfully carrying out the behavior (Ajzen, 1991). In addition, a mistrust of food label information was also mentioned by participants as a reason preventing them from using food labels, also confirming that addressing the credibility of nutrition information may be an important issue to discuss when promoting food label use among college students.

Conclusion and Recommendations

The two most salient themes related to food label use by college students that emerged in this study were self-efficacy and negative social norms. Addressing issues associated with these two constructs may be important in promoting positive attitudes toward and increasing food label use. This study also found reactions to and perceptions of the new food label was positive overall. Participants seemed particularly pleased with improvements of serving size and percent daily value, which were both components of

the current food label participants found most difficult. It may be that the major issues related to self-efficacy and understanding food labels among these college students will potentially be resolved when the new food labels are implemented. However, despite the positive response regarding the new food label there seems to be a lack of motivation or perceived importance surrounding food labels in general, that could deter food label improvements from having a substantial impact on increasing food label use by college students.

As social norms among college students surrounding food labels seem to be fairly negative, future food label promotion or educational programs may want to focus on the benefits and importance of using food labels. It may also be important to promote perceptions that food label use is not only useful to older individuals, or those with allergies or people who are trying to lose weight. Addressing the social environment in the college setting and promoting positive attitudes around label use, and it being a “normal” behavior, may also be beneficial, as perceived social norms can influence an individual’s attitudes and engagement in a behavior (Berkowitz, 2004). In addition, teaching that food label information is credible, and that using food labels does not need to be time consuming, may also prove to be valuable. Health educators may want to introduce smart phone apps that can help student’s access, scan and interpret food labels in a quick and interactive manner. Apps such as “Food Labels with Nutritional Facts” and “Food Labels” provide instant access to databases of common foods and their nutrition information (iTunes, 2015).

Decisional balance and attitudes, self efficacy and social norms each influence perceptions towards a behavior and actual behavior. This study demonstrated a need to

promote more favorable attitudes towards food labels and emphasize their importance, address negative social norms, and equip students with the knowledge and tools they need to better understand and interpret food labels to promote self-efficacy. According to Berkowitz (2004), perceived norms can influence attitudes towards a behavior and how individuals themselves engage in a behavior. As peer influence can have a significant impact on an individual behavior, it is important to either correct misconceptions regarding food label use and social norms, or improve general attitudes towards food label use Berkowitz (2004). Addressing self-efficacy issues is also vital because if college students do not have sufficient confidence in their abilities to understand and effectively use food labels, it could negatively impact their food label use. Future interventions will also need to address decisional balance, and specifically perceived barriers towards food label use, if college students are to increase and improve their healthy eating decisions and habits.

Strengths and Limitations

A major strength of the study was its open-ended approach, allowing college students to share their perceptions of the challenges associated with using food labels and to suggest ways to encourage food label use. In a “Critical Review of the Literature on Nutritional Labeling,” Hieke (2012) discussed that in food label research there is a need for in-depth interviews that can provide insights addressing “why” questions related to label use—this study is a step towards addressing this gap. In addition, recent political attention and the proposal of new food label by the FDA makes this study timely. These findings bring to attention other barriers to label use, such as negative social norms and

self-efficacy issues, that should be addressed to increase label use, and consequently improve nutrition and eating habits among college students. Strengths also include the exploration of health literacy related factors by looking at how college students understood both the current and new food label. Lastly, the use of theoretical constructs to inform the interview guide and data analysis was also a strength of the study.

Limitations of the study include the possibility of selectivity bias, as it could be students with a particular interest in food labels and the importance of nutrition chose to respond and participate. Additionally, interviews took place during the summer semester, as opposed to the fall or spring when most students are enrolled, which may have contributed to selectivity bias as the students available during that time period may not be fully representative of the entire student population. Lastly, as this study is more of an initial exploration of perceptions on food label use and the new proposed food label by the FDA, data saturation did not occur, and future studies and further analysis are necessary to assure a complete qualitative analysis on this topic.

Appendix A: IRB Approval



1204 Marie Mount Hall
College Park, MD 20742-5125
TEL 301.405.4212
FAX 301.314.1475
irb@umd.edu
www.umresearch.umd.edu/IRB

DATE: July 30, 2015

TO: Ayma Rouhani
FROM: University of Maryland College Park (UMCP) IRB

PROJECT TITLE: [749807-3] Understanding Food Label Use in College Students Via Cognitive Interviews

REFERENCE #:
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED
APPROVAL DATE: July 30, 2015
EXPIRATION DATE: June 15, 2016
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

Thank you for your submission of Amendment/Modification materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Prior to submission to the IRB Office, this project received scientific review from the departmental IRB Liaison.

This submission has received Expedited Review based on the applicable federal regulations.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of June 15, 2016.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Unless a consent waiver or alteration has been approved, Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

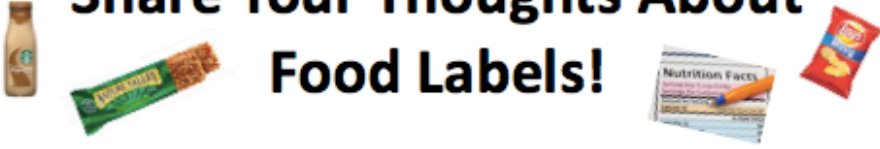
All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Please note that all research records must be retained for a minimum of seven years after the completion of the project.

If you have any questions, please contact the IRB Office at 301-405-4212 or irb@umd.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

Appendix B: Recruitment Flier for Interviews



Share Your Thoughts About Food Labels!













The purpose of this study is to better understand how and what college students think about food label use. As a thank you for participating in a one-hour interview, you will receive **\$20 cash!**

Interviews will take place in the School of Public Health building (Bldg.255). Your responses are confidential.

You are eligible to participate if you:

1. Are a registered student at the University of Maryland, College Park
2. Are between the ages of 18-24
3. Give permission for the interview to be audio recorded

**If interested, email [Ayma Rouhani](mailto:aymarouh@umd.edu) at aymarouh@umd.edu
OR call (443) 741-2273**

 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu	 Ayma Rouhani 443-741-2273 aymarouh@umd.edu
--	--	--	--	--	--	--	--	--	--	--	--

Appendix C: FYI Listerv Post

FYI Listerv Post

Subject: Participate in a 1 hour research study for \$20!

Share your thoughts about food labels

- Researchers want to better understand what college students think about food labels

What?

- One hour interview

Where?

- The School of Public Health building (Bldg.255)

Who?

- Registered student at the University of Maryland, College Park
- Between the ages of 18-24
- Who give permission for the interview to be audio-recorded

Additional Information

- All responses are confidential
- Participants receive \$20 cash!
- If interested email Ayma Rouhani at aymarouh@umd.edu or call 410-302-9468

Appendix D Recruitment Tracking Database

Food Label Recruitment Tracking Sheet.xlsx

Search in Sheet

Home Layout Tables Charts SmartArt Formulas Data Review

Font: Calibri (Body) 12

Number: General

Format: Normal

Cells: Insert Delete Format

Participant ID #	Interview Date and time	Gender	Academic Level	Ethnicity	Department	Date of initial contact	Phone or email	Date of interview confirmation	Willing to be audio recorded
1	June 24, 11:45am	F	Junior	Hispanic	Psych, Math and Science	22-Jun	Email	22-Jun	Y
2	June 24, 1pm	M	Senior	African American	Psychology	18-Jun	Email	22-Jun	Y
3	June 24, 3:15pm	F	Sophomore	Asian	Psychology, minor in neuroscience	22-Jun	Email	22-Jun	Y
4	June 29, 12pm	F	Graduate	White	Psychology	24-Jun	Email	25-Jun	Y
5	June 29, 2:30pm	F	Graduate	African American	Math	23-Jun	Email	23-Jun	Y
6	July 1, 11am	M	Senior	Hispanic/ Lantino	Environmental Science and Policy	19-Jun	Phone	25-Jun	Y
7	July 1, 1pm	F	Junior	African American Indian, South	Family Science	27-Jul	Phone	29-Jun	Y
8	July 7, 11am	M	Senior	Asian	Philosophy	29-Jun	Email	29-Jun	Y
9	August 3, 12pm	F	Sophomore	African American	Bio pre med	28-Jul	Phone	28-Jul	Y
10	August 10, 12:30pm	M	Sophomore	White	chemical engineering	4-Aug	Email	4-Aug	Y
11	August 17th, 2:30pm	M	Graduate	White	chemical engineering		Email	13-Aug	Y
12	August 8, 1:20 pm	M	Freshman	White	Journalsim	4-Aug	Email	13-Aug	Y
13	August 8, 10:30 am	M	Junior	White	Arts and Humanities	30-Aug	Email	30-Aug	Y
14	August 8, 11:15 am	M	Freshman	Asian	Letters and Science	24-Aug	Email	31-Jan	Y
15	September 18, 10:30am	F	Freshman	White	Engineering	13-Sep	Email	16-Sep	Y

Appendix E: Interview Script and Questions.

Introduction

Thank you for participating in this cognitive interview. Your feedback will help us learn more about food label use by college students. The purpose of this interview is to find out how you use food labels, reasons that motivate or prevent you from using them, and how you feel about the new proposed food labels by the Food and Drug Administration (FDA).

This interview is confidential; the only personal information collected is your age, gender ethnicity and academic year in school. You can choose not to answer any question that makes you feel uncomfortable and you can stop the interview at any time.

As mentioned in the Informed Consent form this interview will be audio-recorded. My advisor and I will be the only ones with access to the recordings. Do I have your permission to audio-record this interview?

- If yes – great!
- If no – I am sorry, but study participants must be willing to be audio-recorded. I sincerely thank you for considering being a part of this study.

To begin the Interview:

Cognitive interviewing uses a ‘think-aloud’ process that I will introduce to you through a warm up activity. But first, what questions do you have before we begin?

Answer any questions.

Please remember there are no right or wrong answers.

Feel free to say anything that comes to mind, anything you are thinking.

Probes (For interviewer use only)

For the interview questions I will use these probes, when applicable, to encourage the interviewee to think aloud and share more information.

- *If interviewee asks what she/he is supposed to do*
 - I am interested in what you are thinking as you answer this question. Do whatever you need to help you think aloud about this question and your response.
- *If interviewee appears to be having difficulty thinking aloud*
 - Tell me what you are thinking.
 - What thoughts are going through your mind right now?
- *If thinking aloud with no difficulty*
 - That's great, thinking out loud like this is just what I was hoping for
 - Good. Your comments help me understand what you are thinking about.
- *General probes to encourage thinking aloud:*
 - What were you thinking when you did *(refer to prior body language reactions)* _____?

Think Aloud Warm-Up

Instructions

Thinking aloud may be new and unfamiliar to you, but please know there are no right or wrong answers. I am only interested in knowing what is going on inside your head (what you are thinking or feeling). Any information you provide during this warm up activity will not be used in the study; right now I am just helping you become familiar and comfortable with the 'think-aloud' process.

Visualize the place where you live (i.e. your home or apartment), and think about how many windows there are in that place. As you count the windows, tell me what you are seeing and thinking about.

Interview Questions

Instructions

We will now move on to food label questions and I am going to start the audio recorder. Again, there is no right or wrong answer. Please take as much time as you need to answer the questions.

1. First, I am going to ask you some questions about an ice cream food label. *Hand the food label (Figure 5) to the interviewee.* Please look over the food label. Take as much time as you would like to look over the label. As you're doing this, tell me out loud any thoughts that come to mind.
 - a. Do you think the label is informative?
 - b. What parts grab your attention?
 - c. What do you think about the overall format?
 - d. What other thoughts did you have about the food label that you haven't yet shared?

Figure 5: Food Label for Ice Cream Container

Nutrition Facts			
Serving Size		½ cup	
Servings per container		4	
Amount per serving			
Calories	250	Fat Cal	120
			%DV
Total Fat	13g		20%
Sat Fat	9g		40%
Cholesterol	28mg		12%
Sodium	55mg		2%
Total Carbohydrate	30g		12%
Dietary Fiber	2g		
Sugars	23g		
Protein	4g		8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

2. People tell us they use food product labels in many different ways. Do you think food labels can help people make healthier eating decisions?
 - a. If yes - Can you tell me why and how? Can you give me an example how labels can help people make healthy eating decisions or food choices?
 - b. If no - Can you explain to me why not?

3. Do you use food labels to help you decide which particular food items to buy or eat? If yes, how? Can you think about an example and share it with me?
 - a. If yes - Can you think about and tell me if using food labels is a habit for you, part of your general routine? Why?
 - b. If no – Why have food labels not helped you decide what foods to buy or eat? Do you ever think about using food labels? Why or why not?

4. When you buy a product for the first time do you read food label information?
 - a. What thoughts generally come to mind when you use a food label to buy a new product?

5. Do you use food labels to compare different food items with each other?
 - a. If yes - How is that helpful to you?
 - b. If no - why don't you use food labels to compare different food items

6. Do you use food labels to see if something said in advertising (an ad you saw about the product) or on the package is true?
 - a. If yes - Can you think of a time when you did this? Tell me about it.
 - b. If no - Can you explain to me why not? (Probe: do you typically believe what is written on the front of the package or in an advertisement?)

7. Do you use food labels to get a general idea of the nutritional content of the food?
 - a. If yes - how is it helpful to you?
 - b. If no - why not?
8. Do you ever prepare your own meals?
 - a. Yes
 - b. No
9. (*Ask if individual answered yes to Question 8*) Do you look at food labels to help you in meal planning?
 - a. If yes - how are they helpful to you in meal planning?
 - b. If no - why wouldn't this be helpful to you in meal planning? (Probe: do you not think about your meals at such a micro level?)
10. In the last **two weeks**, can you remember an instance where your decision to buy or use a food product was changed because you read the nutrition label? Can you tell me more about this instance?
11. When applicable - Earlier you said you rarely use the food label when buying or choosing what food items to eat. Do you intend to start using food labels more in the future? Why or why not?
12. People have different reasons for not using the nutrition information on food labels. Can you tell me reasons that prevent you from looking at or using food labels?
13. Do you think other college students use food labels to decide what foods to eat?
14. Do you think other college students use food labels to decide what foods to purchase?
 - a. If yes - Can you tell me how and why?
 - b. If no - Can you explain to me why not?
15. What do you think is the general perception among your friends on using food labels?
16. What is the perception among college students in general on using food labels?
17. Do you think you can read and understand all the information provided on food labels?
 - a. If yes: Can you tell me what parts might sometimes be more difficult to understand?
 - b. If no: Can you tell me about why or what parts are difficult understand?

18. Hand new FDA food label (Figure 6) to the interviewee. This is a new food label proposed by the Food and Drug Administration with an updated format and new content. Do you think it is easier to look at and understand when compared to current food labels? Hand current food label (Figure 5).
- If yes - Can you tell me how and why?
 - If no - Can you explain to me why not?

Figure 6: New Proposed Food Label Format

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per 2/3 cup	
Calories	230
% DV*	
12%	Total Fat 8g
5%	Saturated Fat 1g
	<i>Trans Fat</i> 0g
0%	Cholesterol 0mg
7%	Sodium 160mg
12%	Total Carbs 37g
14%	Dietary Fiber 4g
	Sugars 1g
	Added Sugars 0g
	Protein 3g
10%	Vitamin D 2mcg
20%	Calcium 260mg
45%	Iron 8mg
5%	Potassium 235mg
* Footnote on Daily Values (DV) and calories reference to be inserted here.	

19. Do you think you are more likely to use the new food label when deciding what foods to eat or purchase than the current version?
- If yes - Can you tell me why and how?
 - If no - Can you explain to me why not?
20. Think about reasons that sometimes encourage you to use food labels. Can you tell me about what they are and share one story about when that happened?
21. If you were interested in learning about how to use food labels, how would you prefer to learn about them?
22. Future projects on food label education might focus on college students. What suggestions do you have to get college students to participate in these programs? What suggestions do you have about how food label education programs can be effective in promoting label use by college students?

Lastly, please answer some basic questions about yourself.

23. What is your academic year in school?
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Graduate Student

24. What department are you studying in? _____

25. How old are you? _____

26. What is your gender?
 - a. Male
 - b. Female

27. What is your race or ethnicity
 - a) White
 - b) Black or African American
 - c) Asian
 - d) Native Hawaiian or other Pacific Islander
 - e) American Indian or Alaska Native
 - f) Other

28. Do you do your own grocery shopping or buy the food for your household?
 - a. Yes
 - b. No

29. (*Ask if individual answered yes to Question 26*) How often do you read food labels when doing your own grocery shopping?
 - a. All of the time
 - b. Most of the time
 - c. Sometimes
 - d. Rarely
 - e. Never

30. How often do you purchase foods including snack items such as granola bars, drinks, chips etc.?
 - a. Every day
 - b. A few times a week
 - c. Once a week
 - d. Every few weeks
 - e. Never

31. (*Ask if individual answered a, b, c or d to Question 28*) When buying snack items for the first time, do you typically read the food label?

- a. Yes
- b. No

Great, thank you very much!

Appendix F: Informed Consent Form

1

University of Maryland College Park

*Initials*____ *Date*____

Project Title	Understanding Food Label Use in College Students Via Cognitive Interviews
Purpose of the Study	This research is being conducted by Ayma Rouhani, a Graduate Student, at the University of Maryland, College Park. We are inviting you to participate in this research project because you are a college student between the ages of 18 to 24. The purpose of this research is to better understand how and what college students think about food label use.
Procedures	<p>As a participant in this study you will take part in a one hour individual interview in the School of Public Health building (Bldg.255).</p> <p>Procedures involve responding to questions related to food label use. One example of a question is "have food labels helped you decide which particular food items to buy or eat? If yes, how? Can you think about an example and share it with me?"</p> <p>You will be asked to think aloud your thoughts and answers to the questions.</p> <p>This interview will be audio recorded.</p> <p>Although the interviewer will know your identity, your name will not be included in the interview transcript or research paper. Some demographic information will be collected, specifically age, gender, academic level, department of study, and race or ethnicity. In any research papers, demographic information will only be referred to in the aggregate to protect your identity. Data collected during this project will be stored on a password protected laptop.</p> <p>You will receive \$20 for your time after completing the interview.</p>
Potential Risks and Discomforts	There are no known risks to participating in this study; the topic is not sensitive and all information is confidential. You can pass on any question you do not want to answer and can stop participating at any time.
Potential Benefits	There are no direct benefits from participation in this research. We hope that, in the future, other college students might

	benefit from this study through improved understanding of food label use. Also, researchers may be able to use findings to develop interventions that increase use and promote healthier eating habits.
Confidentiality	<p>Again, some demographic information will be collected (age gender, academic level and race or ethnicity). In any research papers, demographic information will only be referred to in the aggregate to protect your identity. Electronic data, audio recordings and information from this study will be password protected on the principal researcher's laptop. Audio recordings will be destroyed after five years. The principal researcher and her advisor will be the only ones with access to the data.</p> <p>Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.</p>
Compensation	<p>You will receive \$20 in cash for your time. You will be responsible for any taxes assessed on the compensation.</p> <p><input type="checkbox"/> Check here if you expect to earn \$100 or more as a research participant in UMCP studies in this calendar year. You must provide your name, address and SSN to receive compensation.</p> <p><input type="checkbox"/> Check here if you do not expect to earn \$100 or more as a research participant in UMCP studies in this calendar year. Your name, address, and SSN will not be collected to receive compensation.</p>
Right to Withdraw and Questions	<p>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.</p> <p>If you are an employee or student, your employment status or academic standing at UMD will not be affected by your participation or non-participation in this study.</p> <p>If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator:</p>

	<p>Ayma Rouhani SPH Building, Room 2367, University of Maryland College Park, MD 20742 aymarouh@umd.edu (410) 302 9468</p>
Participant Rights	<p>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p> <p>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</p>
Statement of Consent	<p>Your signature indicates you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study and to be audio recorded. You will receive a copy of this signed consent form.</p>

Appendix G: Starting List of Themes

Starting List of Themes

- Label format
 - Informative
 - Grabs attention
- Label use/ behavior
 - First time
 - Compare
 - Advertisement
 - Nutritional content
 - Meal planning
 - Use in past 2 weeks
 - Future
- New label
- Benefits
- Motivators
- Intentions
- Barriers/ Nonuse
- Norms
 - College (students) use
 - College purchase
 - College perceptions
 - Friends
- Self efficacy/ decisional balance
- Education

Appendix H Sample of Initial Identification of Themes by Interview Question

10

- Not now because:
 - Already know: 12
 - Now I'm alright: 12
 - Young: 12
- **12. Non use (barriers)**
 - Already know: 5
 - Don't want: 9, 10
 - Doesn't affect me: 12
 - Don't care: 2, 4
 - Don't pay attention: 9
 - Ignorance and Guilt: 1, 4, 11
 - Not worth: 10
 - No interest: 12
 - Not important: 12
 - Hard to Access: 2
 - Hard to read or understand: 2, 7, 10, 14
 - Added sugar difficulty: 8
 - Color: 7
 - Confused: 6
 - Don't know: 6
 - Font size: 7
 - Serving size difficulty: 8, 11, 13
 - Too small: 10
 - Unintuitive: 8
 - Just want to eat: 10
 - Bad day: 4
 - Hungry: 2
 - Lack of education: 6, 10
 - Money: 6
 - Mislead: 10, 14
 - Mistrust: 5, 8, 9
 - Stigma/ norms/ embarrassing: 15
 - Time: 9, 14
 - Rush: 9
- **13/14. College students use**
 - Yes: 3, 8, 14
 - Athletes: 2
 - Exercise: 8
 - Health: 14
 - Health conscious: 8
 - Health and Fitness: 3
 - More now than before: 3, 4
 - Less stress: 8
 - Weight: 2, 3, 14

Appendix I: Sample of Theme Database

The screenshot shows an Excel spreadsheet with the following data:

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	1 F Junior	2 M Senior	3 F Soph	4 F Grad	5 F Grad	6 M Senior	7 F Jun	8 M Senior	9 F Soph	10 M Soph	11 M Grad	12 M Fresh	13 M Junior	14 M Fresh
PERSONAL LABEL USE														
Yes		1			1	1	1	1			1			1
Routine/ Habit		1				1	1		1		1		1	
No			1							1	1		1	1
Rarely														1
First time?														
Yes		1	1	1	1	1		1	1		1	1	1	
No										1			1	1
Depends							1							
Compare?														
Yes		1	1	1	1	1	1	1		1	1	1	1	
No									1	1				
Sometimes														1
Advertising?														
Yes			1	1		1	1	1	1		1	1	1	
No		1								1			1	1
I would														1
Nutritional Content?														1
Yes		1	1	1	1	1	1	1	1		1		1	1
Sometimes when purchasing											1			
Meal planning														
Yes		1			1	1	1	1	1		1	1		
No				1						1	1			1
Sometimes		1	1											
Changed mind in past 2 week?														
Yes			1	1				1	1	1	1	1		1
No						1	1				1			1
OTHER														
No label				1							1			
USE SOMETIMES				1							1		1	1
ATTITUDES/ DECISIONAL														

References

- Ackermann, A. C., & Blair, J. (2005). Efficient respondent selection for cognitive interviewing. *ASA Section on Survey Research Methods*, 3997–4004.
- Adler, N. E., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs*, 21(2), 60.
- Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice—Hall.
- Ajzen, I. (2006). Constructing a TPB questionnaire: conceptual and methodological considerations. Retrieved from <http://people.umass.edu/aizen/pdf/tpb.measurement.pdf>.
- Ajzen, I. (1985). From intentions to actions: a theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11–39).
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Apple Inc. (2015). iTunes preview – app store. Retrieved from <https://itunes.apple.com/us/genre/ios/id36?mt=8>
- Armitage, C. J., Sheeran, P., Conner, M., & Arden, M. A. (2004). Stages of change or changes of stage? Predicting transitions in transtheoretical model stages in relation to healthy food choice. *Journal of Consulting and Clinical Psychology*, 72(3), 491–499.
- Beatty, P. C., & Willis, G. B. (2007). Research synthesis: The practice of cognitive interviewing. *Public Opinion Quarterly*, 71(2), 287–311.
- Berkowitz, Alan D. (2004) The social norms approach: Theory, research and annotated bibliography. *Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention*. US Department of Education.
- Black, A. (2010). Gen Y: who they are and how they learn. *Educational Horizons*, 88(2), 92-101.
- Blair, J., & Conrad, F. G. (2011). Sample size for cognitive interview pretesting. *Public Opinion Quarterly*, 75(4), 636–658.
- Blair, J., Conrad, F., Ackermann, A. C., & Claxton, G. (2005). The effect of sample size on cognitive interview findings.

- Borsari, BB & Carey, KB (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391-424.
- Boston University School of Public Health. The transtheoretical model (stages of change). Retrieved from <http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/SB721-Models/SB721-Models6.html>.
- BoynntonJarrett, R., Thomas, T. N., Peterson, K. E., Wiecha, J., Sobol, A. M., & Gortmaker, S. L. (2003). Impact of television viewing patterns on fruit and vegetable consumption among adolescents. *Pediatrics*, 112(6), 1321-6.
- Branen, L. (1999). Comparison of college students' current eating habits and recollections of their childhood food practices. *Journal of Nutrition Education*, 31(6), 304-310.
- Brecher, S. J., Bender, M. M., Wilkening, V. L., McCabe, N. M., & Anderson, E. M. (2000). Status of nutrition labeling, health claims, and nutrient content claims for processed foods: 1997 Food Label and Package Survey. *Journal of the American Dietetic Association*, 100(9), 1057-62.
- Bridle, C., Riemsma, R. P., Pattenden, J., Sowden, A. J., Mather, L., Watt, S., & Walker, A. (2005). Systematic review of the effectiveness of health behavior interventions based on the transtheoretical model. *Psychology and Health*, 20(3), 283-301.
- Burnard P. (1991) A method of analysing interview transcripts in qualitative research. *Nurse Education Today*, 11(6), 461-466.
- Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2012). Coding in-depth semistructured interviews: problems of unitization and intercoder reliability and agreement. *Sociological Methods and Research*, 42(3), 294-320.
- Carbone, E.; Campbell, M.; Honess-Morreale, L. (2002). Use of cognitive interview techniques in the development of nutrition surveys and interactive nutrition messages for low-income populations. *Perspectives in Practice*, 102(5), 690-696.
- Caswell, J. A., & Padberg, D. I. (May 01, 1992). Toward a more comprehensive theory of food labels. *American Journal of Agricultural Economics*, 74(2).
- Centers for Disease Control and Prevention (CDC). (2014). Disability and health data system - demographic data guide. Retrieved from <http://dhds.cdc.gov/guides/demographics>.
- Centers for Disease Control. (2015). Nutrition and the health of young people. Retrieved from <http://www.cdc.gov/healthyschools/nutrition/facts.htm>

- Cha, E., Kim, K. H., Lerner, H. M., Dawkins, C. R., Bello, M. K., Umpierrez, G., & Dunbar, S. B. (2014). Health literacy, self-efficacy, food label use, and diet in young adults. *American Journal of Health Behavior*, 38(3), 331-9.
- Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, 21(2), 194–201.
- Cowburn, G., & Stockley, L. (2007). Consumer understanding and use of nutrition labeling: a systematic review. *Public Health Nutrition*, 8(01), 21–28.
- Creswell, J. W. (2007). Chapter 3: Designing a Qualitative Study. *Qualitative Inquiry and Research Design: Choosing among Five Approaches*, 35–41.
- Chase, K., Reicks, M., Smith, C., Henry, H., & Reimer, K. (2003). Use of the think-aloud method to identify factors influencing purchase of bread and cereals by low-income African American women and implications for whole-grain education. *Journal of the American Dietetic Association*, 103(4), 501-504.
- Creswell, J. W. (2007). *Qualitative inquiry and research design* (2nd Ed.) Thousand Oaks, CA: Sage Publications.
- Damman, O. C., Hendriks, M., Rademakers, J., Delnoij, D. M. J., & Groenewegen, P. P. (2009). How do healthcare consumers process and evaluate comparative healthcare information? A qualitative study using cognitive interviews. *BMC Public Health*, 9, 1–14.
- Deshpande, S., Basil, M. D., & Basil, D. Z. (2009). Factors influencing healthy eating habits among college students: an application of the health belief model. *Health Marketing Quarterly*, 28(2).
- Dietary Guidelines Advisory Committee. (2010). Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010, to the Secretary of Agriculture and the Secretary of Health and Human Services. Washington, DC: U.S. Department of Agriculture
- Dietary Guidelines Advisory Committee. (2015). Scientific report of the 2015 dietary guidelines advisory committee, to the Secretary of Health and Human Services and the Secretary of Agriculture. Washington, DC: U.S. Department of Agriculture
- Drichoutis, C., Lazaridis, P., & Nayga, R. M. (2006). Consumers' use of nutritional labels: a review of research studies and issues. *Academy of Marketing Science Review*, 9(9), 1–22.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(Cole 1988), 107–115.

- Food and Drug Administration. (2013). Food labeling guide. Retrieved from <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm2006828.htm#introduction>.
- Food and Drug Administration. (2014). Food: How to Understand and Use the Nutrition Facts Label. Retrieved from <http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm274593.htm#overview>
- Food and Drug Administration. (2014). Justification of estimates for appropriations committee. Retrieved from <http://www.fda.gov/downloads/AboutFDA/ReportsManualsForms/Reports/BudgetReports/UCM388309.pdf>.
- Food and Drug Administration. (2012). Justification of estimates for appropriations committee. Retrieved from <http://www.fda.gov/downloads/AboutFDA/ReportsManualsForms/Reports/BudgetReports/UCM291555.pdf>.
- Food and Drug Administration. (2014). Proposed changes to the nutrition facts label. Retrieved from <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm385663.html>.
- Food and Drug Administration. (2014). Nutrition facts label: read the label youth outreach campaign. Retrieved from <http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm281746.html>.
- Food and Drug Administration. (2011). Federal Register, 76(163), 52665–52667.
- Food and Drug Administration. (2013). Food labeling: trans fatty acids in nutrition labeling, nutrient content claims, and health claims. 68 Federal Register, 41434, 41488, 41, 467.
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison—Wesley.
- Grunert, K., & Wills, J. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health, 15*(5), 385-399.
- Glaser, Barney G. and Strauss, Anselm L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine.

- Guthrie, J. F., Fox, J. J., Cleveland, L. E., & Welsh, S. (1995). Who uses nutrition labeling, and what effects does label use have on diet quality?. *Journal of Nutrition Education*, 27, 4, 163.
- Hawthorne, K. M., Moreland, K., Griffin, I. J., & Abrams, S. A. (2006). An educational program enhances food label understanding of young adolescents. *Journal of the American Dietetic Association*, 106(6), 913–6.
- Henry, H., Reicks, M., Smith, C., Reimer, K., Atwell, J., & Thomas, R. (2003). Identification of factors affecting purchasing and preparation of fruit and vegetables by stage of change for low-income African American mothers using the think-aloud method. *Journal of the American Dietetic Association*, 103(12), 1643-1646.
- Hieke, S., & Taylor, C. R. (March 01, 2012). A Critical review of the literature on nutritional labeling. *Journal of Consumer Affairs*, 46(1) 120-156.
- Hodson, Randy. (1999). *Analyzing documentary accounts*. Thousand Oaks, CA: Sage.
- Horwath, C. C. (1999). Applying the transtheoretical model to eating behaviour change: challenges and opportunities. *Nutrition Research Reviews*, 12, 281–317.
- International Food Information Council Foundation -Turner Research Network. (2014). *Consumer investigation into nutrition facts panels and sugars labeling*, 1–46.
- IFIC Foundation Food Label Consumer Research Project (2014). Letter to the food and drug Administration.
- Jasti, S., & Kovacs, S. (2010). Use of trans fat information on food labels and its determinants in a multiethnic college student population. *Journal of Nutrition Education and Behavior*, 42(5), 307–14.
- Kandel, DB (1985). On processes of peer influences in adolescent drug use: A developmental perspective. *Advances in Alcohol and Substance Use*. 4,139-163.
- Kim, S.-Y., Nayga, R. M. J., & Capps, O. J. (2001). Food label use , self-selectivity , and diet quality. *The Journal of Consumer Affairs*, 35(2), 346–63.
- Kim, S.-Y., Nayga, R. M. J., & Capps, O. J. (2000). of Food label use on the effect intakes : an endogenous nutrient regression analysis switching. *Journal of Agricultural and Resource Economics*, 25(1), 215–231.
- Klopp, P. MacDonald. M. (1981). Nutrition labels: An exploratory study of consumer reasons for nonuse. *Journal of Consumer Affairs*, 15(2), 301-316.

- Kolodinsky, J., Green, J., Michahelles, M., & Harvey-Berino, J. R. (2008). The use of nutritional labels by college students in a food-court setting. *Journal of American College Health, 57*(3).
- Kolodinsky, J., Harvey, Berino, J. R., Berlin, L., Johnson, R. K., & Reynolds, T. W. (2007). Knowledge of current dietary guidelines and food choice by college students: better eaters have higher knowledge of dietary guidance. *Journal of the American Dietetic Association, 107*(8), 1409-13.
- Krall, J. S., & Lohse, B. (2010). Cognitive testing with female nutrition and education assistance program participants informs validity of the Satter eating competence inventory. *Journal of Nutrition Education and Behavior, 42*(4), 277–83.
- Kristal, A. R., Levy, L., Patterson, R. E., Li, S. S., & White, E. (1998). Trends in Food Label Use Associated With New Nutrition Labeling Regulations. *American Journal of Public Health, 88*(8).
- Lando, A. M., & Lo, S. C. (2012). Single-larger-portion-size and dual-column nutrition labeling may help consumers make more healthful food choices. *Journal of the Academy of Nutrition and Dietetics, 113*, 241–250.
- Marietta, A. B., Welshimer, K. J., & Long Andersons, S. (1999). Knowledge, attitudes, and behaviors of college students regarding the 1990 nutrition labeling education act food Labels. *Journal of the American Dietetic Association Journal of the American Dietetic Association, 99*(4), 445-449.
- Mello, M. M., Studdert, D. M., & Brennan, T. A. (2006). Obesity-the new frontier of public health law. *The New England journal of medicine, 354*(24), 2601-2610.
- McColl, Elaine. 2001. “Protocol for cognitive testing of global health status rating items.” Unpublished manuscript.
- McCain G.C. (1988) Content analysis: a method for studying clinical nursing problems. *Applied Nursing Research 1*(3), 146–150.
- Miller, C. K., Edwards, L., Kissling, G., & Sanville, L. (2002). Evaluation of a theory-based nutrition intervention for older adults with diabetes mellitus. *Journal of the American Dietetic Association, 102*, 8, 1089.
- Misra, R. (2002). Influence of food labels on adolescent diet. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 75*(6), 306–310.
- Misra, R. (2007). Knowledge, attitudes, and label use among college students. *Journal of the American Dietetic Association, 107*(12), 2130–4.

- Moorman, C. (1990). The effects of stimulus and consumer characteristics on the utilization of nutrition information. *Journal of Consumer Research*, 17(3), 362–74.
- Murtagh, F., Addington-Hall, J. & Higginson, I. (2007). The value of cognitive interviewing techniques in palliative care research. *Palliative Medicine*, 21, 87–93.
- Nayga, Rodolfo M. (2000). Nutrition knowledge, gender, and food label use. *Journal of Consumer Affairs*, 34(1): 97–112.
- NeumarkSztainer, Diane, Story, Mary, Perry, Cheryl., & Casey, Maryane. (1999). Factors influencing food choices of adolescents. *Journal of the American Dietetic Association*, 99(8), 929-937.
- Ollberding, N. J., Wolf, R. L., & Contento, I. (2010). Food label use and its relation to dietary intake among US adults. *Journal of the American Dietetic Association*, 110(8), 1233-7.
- Patrick, H., & Nicklas, T. A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of the American College of Nutrition*, 24 (2), 83-92.
- Perkins, HW and Berkowitz, AD (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions*, 21(9/10): 961-976.
- Perkins, HW (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol*, 14:164-172.
- Pfizer. (2011). Implementation Guide for the Newest Vital Sign Health. Retrieved from http://www.pfizer.com/files/health/nvs_flipbook_english_final.pdf.
- Preston, C. M., & Alexander, M. (2010). Prevention in the united states affordable care act. *Journal of Preventive Medicine and Public Health*, 43(6), 455-458.
- Prochaska, J. O. (2008). Decision making in the transtheoretical model of behavior change. *Medical Decision Making*, 28, 845–849.
- Prochaska, J.O. , Redding, C.A., & Evers, K. E. (2008). The transtheoretical model and stages of change. In *Health behavior and health education theory, research and practice* (97-121). San Francisco, CA: Jossey-Bass.
- Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research and Practice*, 19(3), 276–288.

- Rasberry, C. N., Chaney, B. H., Housman, J. M., Misra, R., & Miller, P. J. (2007). Determinants of nutrition label use among college students. *American Journal of Health Education, 38*(2), 76-82.
- Reedy J, Krebs-Smith SM. Dietary (2010). Sources of energy, solid fats, and added sugars among children and adolescents in the United States. *Journal of the American Dietetic Association, 110*, 1477–1484.
- Reicks, M., Smith, C., Henry, H., Reimer, K., Atwell, J., & Thomas, R. (2003). Use of the think aloud method to examine fruit and vegetable purchasing behaviors among low-income African American women. *Journal of Nutrition Education and Behavior, 35*(3), 154–160.
- Rothman, R. L., Housam, R., Weiss, H., Davis, D., Gregory, R., Gebretsadik, T., Elasy, T. A. (2006). Patient understanding of food labels: The role of literacy and numeracy. *American Journal of Preventive Medicine, 31*(5), 391-398.
- Sapp, S. G. (1991). Impact of nutrition knowledge within expanded rational expectations model of beef consumption. *Journal of Nutrition Education, 23*(5) 214–222.
- Shafer K. & Lohse B. (2005). How to conduct a cognitive interview: A nutrition education example. Retrieved from http://www.nifa.usda.gov/nea/food/pdfs/cog_interview.pdf.
- Sanlier, N., & Karakus, S. S. (2010). Evaluation of food purchasing behaviour of consumers from supermarkets. *British Food Journal, 112*(2), 140-150
- Silverglade, B., & Heller, I. R. (2010). *Food Labeling Chaos: the case for reform*.
- Smith, S. C., Taylor, J. G., & Stephen, A. M. (2000). Use of food labels and beliefs about diet–disease relationships among university students. *Public Health Nutrition, 3*(2), 175–182.
- Strauss, A., & Corbin, J. 1990. Basics of Qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage
- Swartz, J. J., Braxton, D., & Viera, A. J. (2011). Calorie menu labeling on quick-service restaurant menus: an updated systematic review of the literature. *The International Journal of Behavioral Nutrition and Physical Activity, 8*(1), 135.
- Taylor, C. L., & Wilkening, V. L. (2008). How the nutrition food label was developed, part 1: the Nutrition Facts panel. *Journal of the American Dietetic Association, 108*(3), 437-42.

- Todd, J. E., & Variyam, J. N. (2008). *The Decline in Consumer Use of Food Nutrition Labels, 1995-2006* Economic Research Report No. 63, Economic Research Service, U.S. Dept. of Agriculture. Retrieved from <http://www.ers.usda.gov/Publications/ERR63/ERR63.pdf>.
- Trust for America's Health. (2009). Prevention for a healthier america: Investments in disease prevention yield significant savings, stronger communities. Retrieved from <http://healthyamericans.org/reports/prevention08/Prevention08.pdf>
- Trust for America's Health. (2013). A healthier america 2013: Strategies to move from sick care to health care in the next four years. Retrieved from <http://kresge.org/sites/default/files/Trust-for-Americas-Health.pdf>.
- U.S. Department of Agriculture, Agricultural Research Service, U.S. Department of Health and Human Services, CDC, et al. (2010). What we eat in America, NHANES 2007–2008, individuals 2 years and over (excluding breast-fed children), day 1 dietary intake data, weighted. Washington, DC, U.S. Department of Agriculture.
- United States Department of Agriculture. (2015). Food labeling: frequently asked questions. Retrieved from <https://fnic.nal.usda.gov/food-labeling>.
- U.S. Department of Agriculture, U.S. Department of Health and Human Services (2010). Dietary guidelines for americans, 2010. 7th Edition. Washington, DC, US Government Printing Office.
- United States Department of Agriculture, Services, & U.S Department Health and Human Services. (2010). *Dietary guidelines for americans 2010*
- Videon, T. M., & Manning, C. K. (2003). Influences on adolescent eating patterns: the importance of family meals. *Journal of Adolescent Health, 32*(5), 365-373.
- Williams, D. R., McClellan, M. B., & Rivlin, A. M. (2010). Beyond the affordable care act: Achieving real improvements in americans' health. *Health Affairs, 29*(8), 1481-1488.
- Willis, Gordon. (1994). *Cognitive interviewing and questionnaire design: A training manual.* Cognitive Methods Staff Working Paper Series, No. 7. Hyattsville, MD: National Center for Health Statistics.
- Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design.* Thousand Oaks, Calif: Sage Publications.
- Winnifred, L. R., Chan, M. K.-H., & Greenbaum, S. (2009). Stress and the theory of planned behavior : Understanding healthy and unhealthy eating intentions. *Journal of Applied Social Psychology, 39*(2), 472–493.

Zhang, Y., & Wildemuth, B. M. (2009). Qualitative analysis of content. *Applications of Social Research Methods to Questions in Information and Library Science*, 1(2), 1–12.