A Dissertation

titled

State Legislators’ Support for Evidence-based Obesity Reduction Measures

by

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Submitted to the Graduate Faculty as partial fulfillment of the
requirements for the Doctor of Philosophy Degree in Health Education

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An Abstract of

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Obesity levels in the United States are at an all-time high. Being obese increases the risk for a host of diseases, such as cancer, osteoarthritis, depression, coronary heart disease, and type 2 diabetes. Since the year 2000, there has been increased interest in policy-level approaches aimed at curbing the obesity epidemic. Despite the increased use of policy approaches to reduce the obesity epidemic, the support of state legislators towards evidence-based obesity reduction measures is unknown. Seventeen hypothetical obesity reduction measures were gleaned from the literature and sent via a valid and reliable survey questionnaire to a random sample of 800 state legislators from all 50 United States. Legislators were asked to rate their level of support for each of the 17 hypothetical measures, rate how impactful each measure could be at reducing their state’s obesity level, and identify potential benefits and barriers to the measures. There were 250 questionnaires returned for a 32% response rate. Respondents were approximately evenly split between Republicans (n = 117) and Democrats (n = 122) and were primarily White (79%), male (78%), and overweight or obese (43% and 22% respectively). Overall, public school and community-based measures were supported at approximately the same levels. Taxation-related measures were not well supported. Democrats,
females, and non-White legislators were significantly more supportive of the measures when compared to Republicans, males, and White legislators, respectively. Linear regression revealed that political affiliation, perceived proper role of government, and perceiving obesity as a serious societal problem were significant predictors of legislator support. Legislator BMI, level of education, and geographic region were not significant predictors of support. The most common perceived benefit of passing the legislative measures was “improved health”. The most common perceived barrier was “not the role of government”. Public health advocates interested in promoting obesity prevention legislation at the state level are most likely to find support for their interests among non-White female Democratic legislators regardless of BMI who perceive obesity to be a serious societal problem. Convincing legislators that obesity prevention efforts are under the government’s purview may lead to more successful advocacy.
This dissertation is dedicated with love to my wife Marlene and sons Max and Nolan.
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Chapter 1

Introduction

This chapter provides a context for the present study and introduces the research problem. The chapter contains the following sections: History of Epidemics, Obesity Defined, Financial Costs of Obesity, Policy as a Public Health Tool, State Legislators, Problem Statement, Purpose Statement, Research Questions, Hypotheses, Definitions, Delimitations, Limitations, and Summary.

1.1 A History of Epidemics

An epidemic is defined as a disease or condition “affecting or tending to affect a disproportionately large number of individuals within a population, community, or region at the same time” (Merriam-Webster, 2009). Historically, epidemics have been caused by infectious microbial agents such as *Yersinia pestis* (plague), *Vibrio cholerae* (cholera), *Salmonella typhi* (typhoid fever), influenza virus (flu), and Human Immunodeficiency Virus (Acquired Immunodeficiency Syndrome) (Insel & Roth, 2010). Infectious disease epidemics often began from a common source (blood, water, feces, sputum), spread from village to village infecting many of the inhabitants, and eventually died out once the
microbial agent was isolated and could no longer be transmitted from person to person (World Health Organization, 2009b).

From 1900 to 2000, infectious disease epidemics were greatly reduced or eliminated through the implementation of measures to improve living conditions, such as sanitation and water treatment, along with the discovery of vaccinations and antibiotics (Centers for Disease Control & Prevention, 1999). Subsequently, the average lifespan for Americans almost doubled from about 47 years in 1900 to 77 years in 2006 (Heron et al., 2009). Along with this increased longevity came an increase in the prevalence of an alternative health burden: chronic disease.

Chronic diseases, such as heart disease, cancer, stroke, and chronic lower respiratory disease now comprise four of the top five causes of death in the United States (National Center for Health Statistics, 2008). Heart disease kills almost 630,000 Americans each year, cancer kills over 560,000, and stroke takes another 137,000 lives. All of these chronic diseases are greatly impacted by modifiable lifestyle choices. The health-related choices a person makes, whether they are good choices or poor choices, impact that person’s long-term well-being in terms of chronic disease risk.

In their seminal work, McGinnis and Foege (1993) identified the major modifiable causes of death or, as they termed it, the “actual causes of death.” The top five “actual causes of death” at that time were (in order) tobacco, physical inactivity and diet, alcohol, microbial agents, and toxic agents. Using similar methodology, Mokdad, Marks, Stroup, and Gerberding (2004) revisited the issue of “actual causes of death” in 2000 and discovered that, while the top five “actual causes of death” had not changed in rank order during the 1990s, the proportion of deaths caused by behavioral factors such
as physical inactivity and poor diet was increasing. In their conclusions, Mokdad et al. (2004) predicted that physical inactivity and poor diet would soon overtake tobacco as the leading cause of death in the United States. That prediction does not portend well for the prevalence of obesity in the United States because physical inactivity and poor diet are major risk factors for overweight and obesity.

1.2 Obesity Defined

Obesity is a *chronic* disease epidemic, not just in the United States, but around the world. The World Health Organization coined the term “globesity” as a word to describe “the most blatantly visible-yet most neglected-public health problem” in the world (World Health Organization, 2009a).

Body mass index (BMI) is a widely used index of relative adiposity in children, adolescents, and adults (Lobstein, Baur, & Uauy, 2004). Unlike direct measures of body fatness, such as hydro-densitometry and dual-energy X-ray absorptiometry (DEXA), BMI is an indirect, anthropometric method used to estimate overall levels of an individual’s adipose tissue. Other anthropometric methods for indirect measurement of total body fatness are waist circumference and waist-to-hip ratio. BMI has been shown to be highly correlated \(r = .85\) with direct measures of body fatness, such as DEXA, and thus is an acceptably accurate measure of adiposity (Pietrobelli et al., 1998).

Overweight and obesity are terms given to weight ranges in which risk for certain diseases increases (Centers for Disease Control & Prevention, 2009e). Overweight is defined by the Centers for Disease Control and Prevention (CDC) as having a BMI between 25 and 29.9. A BMI of 30 or higher classifies an individual as obese. BMI,
while a proxy measure of adiposity, has been shown to be highly correlated to body fat percentage (Flegal et al., 2009). It is important to note that the definitions of overweight and obesity vary slightly for children and teens and that the present study focuses mostly on obesity, not overweight, in the United States adult population (over the age 20).

Obesity in the United States changed very little from 1960 to 1980. According to data from the National Health Examination Survey (NHES) and the National Health and Nutrition Examination Survey (NHANES), age-adjusted prevalence of obesity for adults aged 20-74 years was 13.4% in 1960, 14.5% in 1970, and 15% in 1980 (Flegal, Carroll, Ogden, & Johnson, 2002). However, by 1990 the percentage of obese Americans had jumped to 23.3% and continued climbing to 30.9% in 2000. Data from the 2003-2006 NHANES indicated the percentage of obese adults was 37% (Centers for Disease Control & Prevention, 2009g). The most recent NHANES results analyzing data from 1999-2008 suggests that the percent of obese adults was 33.9% (Flegal, Carroll, Ogden, & Curtin, 2010). Therefore, according to NHANES, one out of every three American adults over the age of 20 was obese as of 2008. Regrettably, the chronic health conditions associated with obesity are very costly.

1.3 Financial Costs of Obesity

According to Dor, Ferguson, Langwith, and Tan (2010), obesity-related costs can arise from at least eight sources:

1. Increased direct medical costs
2. Increased absenteeism
3. Lower productivity
4. Short – term disability
5. Disability pension insurance
6. Premature mortality
7. Workers compensation
8. Personal costs (increased consumption of fuel in cars, larger clothing, etc.)

Dor et al. (2010) conclude that the annual, obesity-related direct medical costs (i.e. hospital-based inpatient/outpatient care, office-based care, emergency room care, dental care, and pharmaceuticals) were $4,879 for a female and $2,646 for a male. When the value of premature mortality (lost life) is added, the annual obesity-related cost for a female is $8,365 and $6,518 for a male. Stagnitti (2009) found direct medical costs for obese adults rose 80% from $166.7 billion to $303 billion during the years 2001-2006 with the average obese individual costing $5,148 per year. This is a higher cost estimate than a recent study by the Society of Actuaries which estimated the cost of obesity to the U.S. economy to be $198 billion in 2009 (Behan et al., 2010).

It has been estimated that one-fifth of U. S. healthcare dollars will be spent on treatment for obesity-related illnesses in the near future (Sturm, Ringel, & Andreyava, 2004). In children, obesity-related hospitalization costs alone doubled from 1999 to 2005, going from $126 million to $238 million (Trasande, Liu, Fryer, & Weitzman, 2009). Being obese is estimated to contribute an additional $7 billion per year to Medicare prescription drug costs (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Yang and Hall (2008) found that elderly men who were obese at age 65 spent 6-13% more on healthcare during their lives than their normal weight counterparts. Obese females at age
65 had spent 11-17% more during their lives than normal weight females. Indirect costs of obesity, such as absenteeism, reduced productivity, and premature death were estimated to total $61 billion in 2000 (Centers for Disease Control & Prevention, 2009b).

In terms of state outlay, Finkelstein, Fiebelkorn, and Wang (2004) estimated that California spent the most of any state from 1998-2000 on obesity-related medical care, with $7.7 billion going towards direct medical costs. New York spent $6.1 billion during the same time period while Texas spent $5.3 billion, Pennsylvania spent $4.1 billion and Florida spent $4.0 billion. These expense figures show that the more populous states generally spend more to treat obesity-related health conditions than states with fewer residents. The average resident age and health status also affect obesity-related direct medical expenditures. Concerted action, perhaps in the form of policy changes, is needed to reduce population obesity levels given the enormous sums of money being spent on obesity-related medical care.

1.4 Policy as a Public Health Tool

Epidemics throughout history have been successfully thwarted through the use of policy. Requiring publicly schooled children to follow vaccination schedules, authorizing the fluoridation of drinking water, mandating the use of passenger restraint systems in cars, inspecting food for quality and safety, implementing safe workplace practices, and regulating tobacco are all examples of successful policy changes geared towards improving the public’s health (Insel & Roth, 2010; United States Food & Drug Administration, 2009). Expansive and lasting policy change may also be required to curb the obesity epidemic since individual-level approaches, such as education, do not alter the
“toxic” environment that plays a major role in population-wide overeating and physical inactivity (Sallis & Owen, 2002).

Many avenues exist for obesity-related policy change. Taxes on snack foods and soda are already in place in thirty states while restaurant menu labeling is in place in four states (Levi, Vinter, St. Laurent, & Segal, 2008). Restaurant menu labeling was also included as a provision in President Obama’s Affordable Care Act which was signed into law in March of 2010 (Nestle, 2010). Other policy options include banning the sale of unhealthy food products, limiting the amount of unhealthy food that can be stocked in distributors and grocers, increasing the price of unhealthy foods (e.g. fast food), decreasing the price of healthy foods, setting calorie limits on meals and snacks, and reducing the density of fast-food establishments in certain areas of the country or throughout the country as a whole (Walls et al., 2009).

Personal responsibility and freedom of choice are basic tenets of democracy. Some would argue that any policy action that trammels these principles is not worth the potential health benefits. However, it has been said that “governments and public health researchers who are serious about tackling obesity must consider the toxic environment that has led to the current epidemic.” (Walls, Peteers, Loff, & Crammond, 2009, p. 591). Since policies themselves are “sociocultural influences that can alter physical environments” (Sallis & Owen, 2002, p. 463), effective policy change is an important tool for public health professionals to wield when addressing the “toxic environment.”

Opponents of policy-level strategies, such as taxation of sugared beverages, may suggest that such taxes are regressive. Public health proponents have countered that the health conditions associated with over-consumption of sugared beverages, such as
diabetes, are also regressive (Brownell, 2010). If debate such as this is to be fruitful, it is necessary that the primary stakeholders understand the languages of both public health and political science. Unfortunately, many public health professionals are not well-versed in political science language and legislators are not proficient in public health terminology. A recent article by Mermin and Graff (2009) defined for public health professionals some of the important concepts necessary for policy dialogue, such as police power, allocation of power among federal, state, and local governments, freedom of speech, property rights, privacy, equal protection, and contract rights. Understanding the vocabulary of a field is an important step in adequately applying the literature of the field to a new enterprise, such as obesity policies.

Momentum for policy approaches to reduce population obesity levels is growing. In 2007, the National Cancer Institute held a conference to identify policy influences on diet, physical activity, and energy balance and to develop an obesity policy research agenda. The overall themes that emerged from that conference were acknowledgement of the relative youthfulness of the obesity policy movement, the need for “natural experiments,” the significance of research beyond individual-level behavior change, the need for economic research across multiple policy areas, and the urgency that is needed in all of these areas (McKinnon et al., 2009). These needs could be met with support and legislation from state legislators.

1.5 State Legislators

There are 7,382 state legislators in the United States (Maestas, Neeley, & Richardson, 2003). From 1975 to 2000, only 73 articles surveying state legislators were
published in the top five political science journals (Maestas et al., 2003). State legislators represent a relatively untapped resource for researchers, especially those in the public health field.

The importance of state legislators’ voices in the obesity debate can not be underestimated. Brownell et al. (2009b) explained this importance best when they said “…legislator perceptions of who and how many are affected, and more important, causes of the problem, shape the way obesity is framed in the public debate, the resources devoted to it, the relative roles of treatment, prevention, and education, and how governments respond or fail to respond.” (Brownell, Schwartz, Puhl, Henderson, & Harris, 2009, p.S8).

From 2001 to 2007, there were 625 bills introduced in state legislatures pertaining to obesity (Centers for Disease Control & Prevention, 2007) which amounts to less than 2 bills per state per year. The bills ranged from obesity prevention acts (New York) and establishment of an obesity/overweight school taskforce (New Jersey) to enactment of laws that limit the extent to which individuals can sue certain manufacturers, distributors, and sellers of unhealthy foods for contributing to overweight or obesity-related health conditions (Florida). Other states, such as California, Maine, Massachusetts, and Oregon have recently enacted laws requiring sit-down restaurants and/or restaurant “chains” (15 to 20 or more restaurants) to disclose calorie count information on menus, menu boards, or other “conspicuous” locations within the restaurant. Twenty states have enacted laws that require BMI or other weight-related measures to be used in screenings for schools while some 30 states have passed laws that impose excise taxes on soda and snacks (Trust for America’s Health, 2009).
1.6 Problem Statement

Obesity levels in the United States are at an all-time high (Centers for Disease Control & Prevention, 2009g). The leading “actual cause of death”, tobacco, may soon be overtaken by obesity as the number one killer of Americans (Mokdad et al., 2004). Conservatively, one in four Americans is obese (Centers for Disease Control & Prevention, 2009a). Being obese increases the risk for a host of diseases, such as various forms of cancers (Calle & Thun, 2004), osteoarthritis (Lementowski & Zelicof, 2008), depression (Carpenter, Hasin, Allison, & Faith, 2000), coronary heart disease (Jensen et al., 2008), and type 2 diabetes (Hanley & Wagenknecht, 2008). Put simply, obesity is an independent risk factor for increased morbidity and mortality at any stage of life (Deckelbaum & Williams, 2001; Flegal, Graubard, Williamson, & Gail, 2005).

Obesity prevention efforts that center on personal responsibility strategies like calorie restriction and increased physical activity are popular but have limited value at reducing population obesity levels (Miller, 1999). Millions of Americans are attempting to lose weight at any given time (French, Jeffery, & Murray, 1999). If personal responsibility approaches were successful in the long-term, the prevalence of obesity in the United States would likely be much less than the current 33.9%. Since the year 2000, there has been increased interest in policy-level approaches aimed at curbing the obesity epidemic (Levi, Vinter, St. Laurent, & Segal, 2008) as evidenced by the 625 obesity-related bills introduced in state legislatures from 2001 to 2007 (Centers for Disease Control & Prevention, 2007). Despite the increased use of policy approaches to reduce the obesity epidemic, the support of state legislators towards evidence-based obesity reduction measures is unknown. Knowledge of state legislator support for innovative
obesity reduction measures could help public health professionals advocate for those policies most likely to be enacted.

1.7 Purpose Statement

The purpose of this study is to assess the support state legislators have for evidence-based obesity reduction measures and to gauge legislators’ perceived benefits and perceived barriers to implementing those measures.

1.8 Research Questions

This study will address the following research questions:

1. Do state legislators support obesity reduction measures in public schools?
2. Do state legislators support obesity reduction measures in the community?
3. Do state legislators support taxation-related obesity reduction measures?
4. What are the personal characteristics upon which state legislators vary in perceived benefits to passing obesity reduction measures?
5. What are the personal characteristics upon which state legislators vary in perceived barriers to passing obesity reduction measures?
6. What personal characteristics predict legislator support for obesity reduction measures in public schools?
7. What personal characteristics predict legislator support for obesity reduction measures in the community?
8. What personal characteristics predict legislator support for taxation-related obesity reduction measures?
1.9 Hypotheses

This study will test the following null hypotheses:

*Research Question 1:*

Do state legislators support obesity reduction measures in public schools?

1.1: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by sex (*Independent t-test*).

1.2: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by race (*Independent t-test*).

1.3: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by party affiliation (*ANOVA*).

1.4: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by BMI category (*ANOVA*).

1.5: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by geographic region (*ANOVA*).

1.6: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by perceived problem of obesity in society (*Independent t-test*).

1.7: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by preferred level of governmental involvement in legislating obesity prevention efforts (*ANOVA*).

1.8: There is no statistically significant relationship between legislator support for obesity reduction measures in public schools and number of perceived benefits to passing such measures (*Pearson correlation*).
1.9: There is no statistically significant relationship between legislator support for obesity reduction measures in public schools and number of perceived barriers to passing such measures (*Pearson correlation*).

*Research Question 2:*

Do state legislators support obesity reduction measures in the community?

2.1: There is no statistically significant difference in legislator support for obesity reduction measures in the community by sex (*Independent t-test*).

2.2: There is no statistically significant difference in legislator support for obesity reduction measures in the community by race (*Independent t-test*).

2.3: There is no statistically significant difference in legislator support for obesity reduction measures in the community by party affiliation (*ANOVA*).

2.4: There is no statistically significant difference in legislator support for obesity reduction measures in the community by BMI category (*ANOVA*).

2.5: There is no statistically significant difference in legislator support for obesity reduction measures in the community by geographic region (*ANOVA*).

2.6: There is no statistically significant difference in legislator support for obesity reduction measures in the community by perceived problem of obesity in society (*Independent t-test*).

2.7: There is no statistically significant difference in legislator support for obesity reduction measures in the community by preferred level of governmental involvement in legislating obesity prevention efforts (*ANOVA*).
2.8: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived benefits to passing such measures (*Pearson correlation*).

2.9: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived barriers to passing such measures (*Pearson correlation*).

*Research Question 3:*

Do state legislators support taxation-related obesity reduction measures?

3.1: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by sex (*Mann-Whitney U Test*).

3.2: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by race (*Mann-Whitney U Test*).

3.3: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by party affiliation (*Kruskal-Wallis*).

3.4: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by BMI category (*Kruskal-Wallis*).

3.5: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by geographic region (*Kruskal-Wallis*).

3.6: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by perceived problem of obesity in society (*Mann-Whitney U Test*).
3.7: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by preferred level of governmental involvement in legislating obesity prevention efforts (Kruskal-Wallis).

3.8: There is no statistically significant relationship between legislator support for taxation-related obesity reduction measures and number of perceived benefits to passing such measures (Spearman’s rho).

3.9: There is no statistically significant relationship between legislator support for taxation-related obesity reduction measures and number of perceived barriers to passing such measures (Spearman’s rho).

Research Question 4:

What are the personal characteristics upon which state legislators vary in perceived benefits to passing obesity reduction measures?

4.1: There is no statistically significant difference in number of perceived benefits by sex (Independent t-test).

4.2: There is no statistically significant difference in number of perceived benefits by race (Independent t-test).

4.3: There is no statistically significant difference in number of perceived benefits by party affiliation (ANOVA).

4.4: There is no statistically significant difference in number of perceived benefits by BMI category (ANOVA).

4.5: There is no statistically significant difference in number of perceived benefits by geographic region (ANOVA).
4.6: There is no statistically significant difference in number of perceived benefits by perceived problem of obesity in society (Independent t-test).

4.7: There is no statistically significant difference in number of perceived benefits by preferred level of governmental involvement in legislating obesity prevention efforts (ANOVA).

Research Question 5:

What are the personal characteristics upon which state legislators vary in perceived barriers to passing obesity reduction measures?

5.1: There is no statistically significant difference in number of perceived barriers by sex (Independent t-test).

5.2: There is no statistically significant difference in number of perceived barriers by race (Independent t-test).

5.3: There is no statistically significant difference in number of perceived barriers by party affiliation (ANOVA).

5.4: There is no statistically significant difference in number of perceived barriers by BMI category (ANOVA).

5.5: There is no statistically significant difference in number of perceived barriers by geographic region (ANOVA).

5.6: There is no statistically significant difference in number of perceived barriers by perceived problem of obesity in society (Independent t-test).
5.7: There is no statistically significant difference in number of perceived barriers by preferred level of governmental involvement in legislating obesity prevention efforts (ANOVA).

Research Question 6:

What personal characteristics predict legislator support for obesity reduction measures in public schools?

6.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in public schools. (Linear Regression).

Research Question 7:

What personal characteristics predict legislator support for obesity reduction measures in the community?

7.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in the community (Linear Regression).
Research Question 8:

What personal characteristics predict legislator support for taxation-related obesity reduction measures?

8.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for taxation-related obesity reduction measures (*Linear Regression*).

1.10 Definitions

**Bill** – a form or draft of a proposed statute presented to a legislature, but not yet enacted or passed and made law (Dictionary.com, n.d.).

**BMI** – body mass index; calculated as weight in kilograms divided by the square of height in meters (Flegal, et al., 2002).

**Earmarks** – An inclusion to a law by a member of Congress to specify funds for a particular purpose, bypassing executive branch merit-based or competitive allocation processes or otherwise limiting the ability of the executive branch to manage aspects of funds allocation (America.gov, n.d.).

**Fast food** – food, as hamburgers, pizza, or fried chicken, that is prepared in quantity by a standardized method and can be dispensed quickly at inexpensive restaurants for eating there or elsewhere (Dictionary.com, n.d.).
Foods of minimal nutritional value – water ices, chewing gum, hard candy, jellies and gums, marshmallow candies, fondant, licorice, spun candy, and candy-coated popcorn (United States Department of Agriculture, 2009).

Healthier foods and beverages – foods and beverages with low energy density and low content of calories, sugar, fat, and sodium (Institute of Medicine, 2005b).

Law – any written or positive rule or collection of rules prescribed under the authority of the state or nation, as by the people in its constitution (Dictionary.com, n.d.).

Menu-labeling – the placement of nutritional information in clear and conspicuous typeface next to each standard menu item (Levi, Vinter, St. Laurent, & Segal, 2008, p. 70).

Obesity – body mass index above 30 (Centers for Disease Control & Prevention, 2009e).

Obesogenic environment – environments that promote increased food intake, non-healthful foods, and physical inactivity (Centers for Disease Control & Prevention, 2011).

Overweight – body mass index between 25 and 29.9 (Centers for Disease Control & Prevention, 2009f).

Policy – the things government chooses to do or not to do (Dye, 1984, p. 247).


Restaurant – a business establishment where meals or refreshments may be purchased (Merriam-Webster, n.d.).

State Legislator – publicly elected official in one of the 50 United States currently serving in either the House or Senate of that state’s legislature.
Support – the likelihood of voting for an obesity reduction bill, co-sponsoring a bill, or serving on a committee whose task is drafting a bill.

“Traffic light” method – a food labeling method used to influence the nutritional quality of shoppers’ food by denoting green for a healthy choice, yellow for a less healthy choice, and red for the least healthy choice (Beard, Nowson, & Riley, 2007).

Snacks – food items of minimal nutritional value, such as water ices, chewing gum, hard candy, jellies and gums, marshmallow candies, fondant, licorice, spun candy, and candy-coated popcorn (United States Department of Agriculture, 2009).

Soda – a drink made with soda water, flavoring, such as fruit or other syrups, and often ice cream, milk, etc. (Dictionary.com, n.d.).

Sugar-sweetened beverages – liquids that are sweetened with various forms of sugars that add calories. These beverages include, but are not limited to, soda, fruit ades and fruit drinks, and sports and energy drinks (United States Department of Agriculture & United States Department of Health and Human Services, 2011).

Underserved area – a census tract with a median income at or below 90% of the median income of the metropolitan area (United States Department of Housing and Urban Development, 2010).

Wellness – the ability to live life fully with vitality and meaning (Insel & Roth, 2010).

1.11 Delimitations

This study was delimited to a national cross-section of currently seated state legislators in the 50 United States.
1.12 Limitations

This study contains several potential limitations:

- The cross-sectional nature of the design limits the ability to derive causation.
- The extent to which the return rate is less than 100% represents non-response bias and is a threat to the external validity of the results.
- Self-reported data contains inherent flaws, such as giving socially desirable responses and recall bias. The extent to which the data contain such flaws threatens the internal validity of the results.
- The closed format of the survey instrument may not provide all possible response choices that could influence the dependent variables. The extent to which important items are not present on the survey instrument represents measurement error and threatens the internal validity of the results.
- The monothematic nature of the survey may create a unique mindset surrounding obesity reduction measures. The extent to which this occurs threatens the internal validity of the results.
- The low response rate of 32% threatens the external validity of the findings. This response rate was most likely an artifact of sending the survey out during the summer months when many legislators were out of session or possibly vacationing and the absence of a $1 incentive.
- It is unknown whether state legislators fully appreciate the obesity problem and understand the extent to which obesity affects their constituents.
1.13 Summary

In the past 100 years, infectious disease epidemics have given way to chronic disease epidemics. The chronic disease epidemic of obesity may soon overtake tobacco as the number one killer of Americans. Policy approaches to the obesity problem hold much promise for slowing or reversing the rise in population BMI. Knowing the perceptions state legislators have towards hypothetical obesity reduction measures, such as prohibiting toys in fast food meals, restaurant menu labeling, and labeling of healthy food items in grocery stores, can inform lobbying efforts aimed at encouraging the passage of such bills.
Chapter 2

Literature Review

The purpose of this chapter is to review the research literature on obesity as well as the health policy research literature as it relates to obesity issues. Studies of state legislators will also be examined. The chapter is divided into ten major sections. The first section reviews the prevalence of obesity in the United States. Section two reviews the health effects of obesity in relation to the six dimensions of wellness (physical, emotional, intellectual, spiritual, social, and environmental). The third section details several purported causes of obesity. Section four examines the role policy has played in public health historically. Section five considers the proper place of government intervention into personal matters. The sixth section describes how policy changes helped to greatly reduce the level of tobacco consumption in the United States and suggests how the tobacco model might inform obesity reduction policy efforts. Individual-level approaches to reducing obesity levels are reviewed in section seven while section eight explores policy-level approaches to obesity reduction. In the ninth section, previous research of state legislators will be explored. The tenth section provides an overview of
2.1 Obesity Prevalence

It is estimated that 9.8% of adult males are obese and 13.8% of adult females are obese worldwide (Farzadfar et al., 2011). As mentioned in Chapter 1, the latest NHANES data on Americans shows adult obesity prevalence to be much higher (33.9%) than the worldwide prevalence. The CDC’s Behavioral Risk Factor Surveillance System (BRFSS) provides a lower estimate of adult obesity levels for Americans than NHANES. BRFSS data from 2008 gauges adult obesity at 26.7%, up from 25.6% in 2007 (Centers for Disease Control & Prevention, 2009a). According to the BRFSS, about one out of every four American adults was obese as of 2007.

It is important to note the methodological differences between the NHANES and BRFSS survey. The NHANES measures subjects’ height and weight in a mobile examination center using standardized techniques and equipment. The BRFSS, in contrast, is a telephone survey that polls a larger sample of Americans than NHANES but relies on self-reported height and weight measures. People tend to overestimate their height and underestimate their weight (Gorber, Tremblay, Moher, & Gorber, 2007). This may result in the BRFSS yielding lower estimates of obesity prevalence that do not truly represent population levels (Mokdad et al., 1999; Yanovski & Yanovski, 2011).

Obesity is not evenly distributed by sex, race/ethnicity, socioeconomic status, or geographic location. Minority populations and females are disproportionately affected by obesity. According to the 2003-2006 NHANES, the level of obesity among females was
42.4% compared to 31.9% for males (Centers for Disease Control & Prevention, 2009g). It was also reported that obesity for females by race/ethnicity varied from a high of 53% for non-Hispanic Black females to 42% for Mexican American females and 32% for non-Hispanic White females. Obesity prevalence among males also varied by race/ethnicity. Obesity prevalence was 35% for non-Hispanic Black males, 32% for non-Hispanic White males, and 29% for Mexican American males. The most recent NHANES report incorporating BMI data from 1999-2008 yielded the obesity prevalence results depicted in Table 2.1.

Table 2.1: Obesity prevalence by race and sex.

<table>
<thead>
<tr>
<th>Race/Sex</th>
<th>Percent Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>33.9</td>
</tr>
<tr>
<td>All males</td>
<td>32.2</td>
</tr>
<tr>
<td>Non-Hispanic White males</td>
<td>31.9</td>
</tr>
<tr>
<td>Non-Hispanic Black males</td>
<td>37.3</td>
</tr>
<tr>
<td>Hispanic males</td>
<td>34.3</td>
</tr>
<tr>
<td>Mexican American males</td>
<td>35.9</td>
</tr>
<tr>
<td>All females</td>
<td>35.5</td>
</tr>
<tr>
<td>Non-Hispanic White females</td>
<td>33.0</td>
</tr>
<tr>
<td>Non-Hispanic Black females</td>
<td>49.6</td>
</tr>
<tr>
<td>Mexican American females</td>
<td>45.1</td>
</tr>
<tr>
<td>Hispanic females</td>
<td>43.0</td>
</tr>
</tbody>
</table>

The BRFSS yields slightly lower estimates of obesity prevalence by gender and race/ethnicity. For the period 2006-2008, the breakdown was as follows: non-Hispanic Black females (39%), non-Hispanic Black males (32%), Hispanic females (29%), Hispanic males (28%), non-Hispanic White females (22%), non-Hispanic White males (25%) (Centers for Disease Control & Prevention, 2009c).

Geographic location also plays a role in the prevalence of obesity in the U.S. According to the 2008 BRFSS, Colorado was the only state to have a prevalence of obesity under 20% (Centers for Disease Control & Prevention, 2009a). Southern states such as Mississippi (33%), Alabama (32%), South Carolina (31%), and Tennessee (31%) experience higher rates of obesity compared to eastern states such as Connecticut (21%), Massachusetts (21.5%), and Rhode Island (22%). The increased prevalence of obesity in southern states compared to eastern states may be partially due to disparities in the socioeconomic status (measured by level of education) of residents. Historically, having lower socioeconomic status placed a person at greater risk of becoming obese. However, in the past 30 years, the role of socioeconomic status has diminished such that the relative difference in obesity prevalence between those with less than a high school education, those with a high school diploma, and the college-educated was just 14% in 2000 compared to 50% in 1971 (Zhang & Wang, 2004).

While it is possible to become obese as an adult, it is more probable that an obese adult was first an obese child (Freedman et al., 2005). This tracking of obesity from childhood to adulthood is troubling considering that children and adolescents are also experiencing increased rates of obesity. A study by Moss and Yeaton (2011) utilized data from the Early Childhood Longitudinal Study-Birth Cohort that followed 7,500
babies from age nine months to 2 years. The researchers found that 16.7% of the nine month old babies were obese and 21% of the 2 – year olds were obese. Furthermore, Hispanic babies and babies from families of low socioeconomic status were more likely to be obese. Data from NHANES 2003-2006 shows obesity levels to be 12% for ages 2-5, 17% for ages 6-11, and 18% for ages 12-19 (Ogden, Carroll, & Flegal, 2008). Among low-income, preschool aged children, obesity rose from 12% in 1998 to 15% in 2008 (Centers for Disease Control & Prevention, 2009f). In 2007, students in 9th through 12th grades self-reported obesity prevalence at 13% (Centers for Disease Control & Prevention, 2008).

Since obesity tends to track from childhood into adulthood, it is worth considering the tracking of obesity from adulthood into old age. This has proven to be a difficult trend to demonstrate due to the myriad of health problems, medical treatments, and natural aging processes that lead to a loss of lean mass in old age (Willet, Hu, Colditz, & Manson, 2005; Yang & Hall, 2008). Some studies have shown that older adults may not be impacted by the increasing prevalence of obesity like other age groups. For example, in a retrospective cohort study of 7441 community-dwelling adults aged 70 years and over during 1993-2002, He and Meng (2008) reported average weight loss of 3.41 kg for men and 3.29 kg for women. The authors concluded that older individuals are more prone to weight loss than to weight gain. However, as the prevalence of obesity in adults increases and the number of people living beyond age 70 also increases, more and more Americans are likely to reach old age in an obese state.
2.2 Health Effects of Obesity

The health effects of obesity are numerous. To better understand the multitude of health consequences arising from obesity, the six dimensions of wellness as described by Insel & Roth (2010) will be used to parcel the health effects into each dimension. The dimensions of wellness are physical, emotional, intellectual, spiritual, social, and environmental. It should be noted that these six dimensions of wellness constantly interact in a dynamic way such that a change in one dimension likely leads to changes in one or more of the other dimensions. Parceling the health effects of obesity into six categories is for heuristic purposes only. Table 2.2 summarizes some of the health effects of obesity for each dimension of wellness.

Table 2.2: Health effects of obesity by dimension of wellness.

<table>
<thead>
<tr>
<th>Wellness dimension</th>
<th>Potential health effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Attention deficit/hyperactivity disorder, asthma, cancer, coronary heart disease, congestive heart failure, diabetes, gall stones, hypertension, hyperlipidemia, metabolic syndrome, osteroarthritis, pregnancy complications, sleep apnea, stroke</td>
</tr>
<tr>
<td>Emotional</td>
<td>Depression, reduced self – esteem, emotional eating</td>
</tr>
<tr>
<td>Intellectual</td>
<td>Alzheimer’s disease, deficits in abstract reasoning, dementia, learning difficulty, reduced memory capacity, poor executive functioning</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Negative body image, reduced self – worth, suicide ideation, suicide attempts</td>
</tr>
<tr>
<td>Social</td>
<td>Social stigmatization, employment discrimination</td>
</tr>
<tr>
<td>Environmental</td>
<td>Inflammation, thyroid disease, crime – related injury, depleted natural resources</td>
</tr>
</tbody>
</table>
2.2.1 Physical effects

According to Insel & Roth (2010), the physical dimension of wellness includes the body’s overall condition and absence of disease along with one’s fitness level and self-care ability. There are a myriad of adverse physical health maladies that can arise from being obese. Obesity has been linked to osteoarthritis (Lementowski & Zelicof, 2008), gallstones (Khare, Everhart, Maurer, & Hill, 1995), attention-deficit/hyperactivity disorder (Fuemmeler, Ostbye, Yang, McClenon, & Kollins, 2010), sleep apnea (Young, Peppard, & Gottlieb, 2002), and asthma (Schachter, Salome, Peat, & Woolcock, 2001). The link between obesity and various forms of cancer is also well established (Calle & Thun, 2004), with especially strong associations between obesity and colon cancer (Giovannucci, Colditz, Stampfer, & Willett, 1996), pre-menopausal breast cancer (Huang et al., 1997), and endometrial cancer (Kaaks, Lukanova, & Kurzer, 2002). In females, increased body weight has been associated with impaired motor function (Lafortuna, Agosti, Proietti, Adorni, & Sartorio, 2006). Being obese also increases the risk of experiencing complications during pregnancy (Garbaciak, Richter, Miller, & Barton, 1985) and significantly lowers the odds of living into old age (Sun et al., 2009).

Perhaps the most significant physical effect of obesity lies in the excess strain placed on the heart. Data from NHANES has shown that 38% of adult males and 32% of adult females with a BMI above 30 have high blood pressure (Brown et al., 2000). This translates into a two-fold increased risk for high blood pressure compared with men and women with a BMI below 25. A very large international study (Dyer & Elliot, 1989) conducted on more than 10,000 men and women has shown that a 10 kg increase in body weight leads to a 3.0 mm Hg increase in systolic blood pressure and 2.3 mm Hg increase.
in diastolic blood pressure. These increases in blood pressure boost the risk for cardiovascular disease by 12% and the risk for stroke by 24%.

Also in terms of cardiovascular health, being obese increases the likelihood of having a high total cholesterol level (Brown et al., 2000), high triglyceride levels (Denke, Sembros, & Grundy, 1993), coronary heart disease (Jensen et al., 2008), low levels of high-density lipoprotein (Brown, et al., 2000), elevated low-density lipoprotein levels (Denke, Sembros, & Grundy, 1993), and congestive heart failure (Hubert, Feinleib, McNamara, & Castelli, 1983). Data from the Framingham Heart Study also suggest a relationship between increased BMI and increased risk of stroke. Although a more recent study suggests that the better predictor of stroke in obese individuals is not elevated BMI levels but intra-abdominal deposits of adipose tissue (Suk et al., 2003).

The link between excessive weight and risk for developing type 2 diabetes has been well established (Hanley & Wagenknecht, 2008). Data from the Nurses Health Study suggest that the risk for type 2 diabetes in females increases as BMI climbs above 22 (Colditz et al., 1990). Some estimates propose that for every additional BMI unit above 22, risk for type 2 diabetes increases by almost 25% (Colditz, Willett, Rotnitzky, & Manson, 1995). Traditionally, type 2 diabetes has been considered primarily a disease associated with weight gain after the age of 18 (Chan, Rimm, Colditz, Stampfer, & Willett, 1994) hence its colloquial name “adult onset” diabetes. Unfortunately, type 2 diabetes is now becoming more common in youths.

The medical condition termed “metabolic syndrome” demonstrates the convergence of obesity-related physical maladies that often occur in obese individuals. The conditions associated with metabolic syndrome increase the risk for vascular disease
(Grundy, 2006). For example, metabolic syndrome has been found to be a better predictor of stroke than obesity alone (Wang et al., 2008). To be diagnosed with metabolic syndrome, a patient exhibits three of the five following physical conditions: increased waist circumference, high triglycerides, low HDL levels, high blood pressure, and elevated fasting glucose (Grundy et al., 2005). The complex relationship between obesity, diabetes, and cardiovascular disease is manifested in metabolic syndrome and its numerous effects on physical health (Furie et al, 2011).

2.2.2 Emotional effects

Being emotionally well means having a capacity to deal with one’s feelings and thoughts, being able to manage reactions to others, having the capability to problem-solve emotional challenges as they arise, and maintaining a relatively steady state of emotional stability throughout the lifespan (Insel & Roth, 2010). Perhaps the biggest impediment to an obese individual’s emotional wellness comes in the form of depression. Carpenter, Hasin, Allison, and Faith (2000) utilized height and weight data from the National Longitudinal Alcohol Epidemiologic study of 40,086 African Americans and Whites to determine body weight’s association with clinical depression, suicide ideation, and suicide attempts. This study was the first of its kind to use a national sample along with the diagnostic criteria contained in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). The authors found a significant U-shaped relationship between BMI and major depression such that individuals with high and low BMI had an increased likelihood of having had past-year depression, suicide ideation, and suicide attempts. Interestingly, this relationship did not differ by race. However, the
relationship was the opposite for the men in the study. Obese males had fewer major depressive episodes, less suicide ideation, and fewer suicide attempts in the past year than did their normal weight counterparts. The authors hypothesized that the inverted relationship according to gender was due to the stigma attached to being an obese female in the United States.

The relationship between obesity and depression is complex. A study by Franko, Striegel-Moore, Thompson, Schreiber, and Daniels (2005) followed 1554 black and white adolescent females from the National Heart, Lung, and Blood Institute’s Growth and Health Study to determine if adolescent depression predicted obesity. The researchers found that the girls who displayed depressive symptoms at ages 16 and 18 were significantly more likely to be obese at age 21. More research is needed to determine whether depression causes obesity or vice versa.

Being obese not only increases the risk of emotional maladies like depression, it also hinders the ability to cope with health conditions once they are contracted. A study by Okifuji, Donaldson, Barck, and Fine (2010) recently showed that obesity significantly adds to the disease and disability burden associated with fibromyalgia. The authors concluded that obesity is a common condition among those with fibromyalgia and that being overweight compromises outcomes for these patients.

2.2.3 Intellectual effects

Intellectual wellness involves having an active and creative mind, being open to new ideas, maintaining the capacity to think critically, and welcoming new experiences (Insel & Roth, 2010). Obesity can have a detrimental effect on brain functioning and
intellectual wellness. Data from the Framingham Heart Study on 551 males over a 6 year surveillance period showed adverse effects of obesity on the cognitive performance domains of learning, memory, executive functioning, and abstract reasoning (Elias, Elias, Sullivan, Wolf, & D’Agostino, 2003). The researchers controlled for confounding variables such as age, education, occupation, smoking status, alcohol consumption, diabetes diagnosis, and total cholesterol. As a result, obesity was concluded to be an independent risk factor for cognitive deficit in adult males.

Being obese during midlife years has been linked to decline in cognitive functioning later in life (Gorospe & Dave, 2007). The Honolulu Heart Study (Stewart et al., 2005) followed 1,890 Japanese men over a 32 year time period. The men were weighed six times between 1965 and 1999 and then screened for dementia three times starting in 1999. The authors found that midlife weight gain led to an increased risk in vascular dementia. These results are similar to the findings from a Kaiser-Permanente study which followed 10,276 patients aged 40-45 for 27 years to examine the link between obesity and dementia (Whitmer, Gunderson, Barrett-Connor, Quesenberry, & Yaffe, 2005). Results showed that obese patients screened between 1964 and 1973 were at an increased risk for diagnosis of dementia between 1994 and 2005. In a follow-up study, Whitmer, Gunderson, Quesenberry, Zhou, and Yaffe (2007) demonstrated an association between midlife obesity and onset of Alzheimer’s disease later in life in the same study population. Even after controlling for age, education, race, sex, marital status, smoking, hyperlipidemia, hypertension, diabetes, ischemic heart disease, and stroke, the researchers showed that individuals who were obese during midlife were three times more likely to be diagnosed with Alzheimer’s disease later in life.
Being obese can also complicate outcomes for patients who already have dementia. In a retrospective, 18 year follow-up study of women with dementia, Gustafson, Rothenberg, Blennow, Steen, and Skoog (2003) reported that obese individuals were at an increased risk for Alzheimer’s disease. The authors stated that for every unit increase in BMI at age 70, risk for Alzheimer’s increased by 36%. However, there is some evidence that weight gain during old age for adults without dementia may have a protective effect in terms of risk for developing dementia later in life (Fitzpatrick et al., 2009).

The physiological mechanism between obesity and dementia has not been well established. Typically, dementia exists in two forms: Alzheimer’s type and vascular type (Barrett-Connor, 2007). Some researchers believe dementia arises from obesity due to abnormalities that develop in the insulin signaling pathways within the brain (Naderali, Ratcliffe, & Dale, 2009). Others believe the link lies within obesity-associated abnormalities in cerebral blood pressure (Elias, Elias, Sullivan, Wolf, & D’Agostino, 2003). Metabolic syndrome (Yaffe et al., 2004) and inflammation (Casserly & Topol, 2004) have also been implicated as obesity-related agents responsible for cognitive decline.

2.2.4 Spiritual effects

A person who is spiritually well has a collection of beliefs and values that guides their life and provides meaning and purpose for them. Meaning and direction in life can come from things like organized religion, art, meditation, family, and nature. Spiritual wellness helps people through difficult episodes in life by counteracting cynicism, anger,
and pessimism (Insel & Roth, 2010). Hawks (2010, p. 245) illustrates the importance of considering the impact of spiritual wellness on overall health in the following vignette:

“Consider the overweight, middle-aged, divorced gentleman, hopelessly entangled in a dead-end career, who spends inordinate amounts of time on the couch in front of the TV-eating chips, smoking cigarettes, drinking beer, and feeling sorry about his lonely and meaningless existence. In fact, he believes that his TV, stimulants, and snacks are the only things that make his otherwise unbearable life somewhat tolerable. How will this good man respond to the modern health educator who…enthusiastically promotes dietary restraint, nicotine patches, and treadmills as the path to good physical health?”

The connection between spirituality, overall health, and quality of life has been fairly well established (Sawatzky, Ratner, & Chiu, 2005). The link between impaired spiritual wellness and obesity in particular is becoming clearer. In a study of 527 college freshman, Dennis and Muller (2003) found a strong link between less spirituality and obesity. The authors administered spirituality and control-over-life inventories and recorded the height and weight measurements of the students. Results showed obese students scored lowest on spirituality. The results imply that being spiritually well may have a protective effect against obesity for these students.

Spiritual wellness also includes feelings of self-worth, which is closely tied to body image. Being obese can severely impact one’s body image and feelings of self-worth which may lead some individuals to question whether life is worth living (Mussell et al., 1996). As noted previously, Carpenter et al. (2000) showed an increased risk for suicide ideation and suicide attempts in obese African American and White women over the age of 18. Dissatisfaction with one’s body has also been linked to increased suicide risk in college students (Pompili et al., 2007).
2.2.5 Social effects

Being able to establish and sustain supportive relationships with others is indicative of attaining social well-being. Social wellness also relates to the ability to contribute positively to the community and to society in general (Insel & Roth, 2010). Obesity can impair an individual’s social wellness primarily due to the social stigmatization attached to being obese in the United States. Americans are bombarded with images of thin, fit male and female models in magazines, on television, and in movies. Accordingly, there has been a steady increase over the past two decades in the amount of pressure many Americans feel to attain a slimmer body (Cash & Pruzinsky, 2002). Data show that 34% of college students feel they are overweight, 47% are currently trying to lose weight, 49% have exercised to lose weight, and 33% have dieted to lose weight (American College Health Association, 2010).

When heavy characters are portrayed in the media, it is often for comedic purposes. In fact, negative attitudes toward obese individuals have been well documented in occupational environments. Klassen, Jasper, & Harris (1993) conducted a study in which 216 female business students reviewed fictitious employee summary sheets containing height, weight, and personality descriptions to determine which person they would prefer to work alongside. The female students in the study were significantly more likely to choose to work with the thin coworker than the obese coworker. Another study (Pingitore, Dugoni, Tindale, & Spring, 1994) utilized actors dressed in prosthetics to simulate obese job applicants. The actors were videotaped during mock interviews with and without the prosthetics in place. After viewing the videotapes, study participants showed much greater employment bias toward the actors wearing the
obesity-simulating prostheses and were much less likely to recommend the obese actors for sales positions. Also within the employment realm, obese individuals have been found to earn 12% less than non-obese colleagues (Register & Williams, 1990), be less likely to be promoted (Bordieri, Drehmer, & Taylor, 1997), and pay higher health insurance premiums (Paul & Townsend, 1995).

It has been found that heavier African American teenage girls hold less positive social self-images than less heavy peers (Granberg, Simons, & Simons, 2009). However, there appears to be racial differences in terms of the social pressures attached to obesity. Both college-age and elderly black females have reported less social pressure to be thin, less fear of being overweight, and less concern about dieting than their female white counterparts (Rucker & Cash, 1992; Stevens, Kumanyika, & Keil, 1994). Nevertheless, feelings of being socially unaccepted are quite prevalent in obese individuals regardless of race.

Being obese can cause individuals to feel awkward in social settings or to avoid social situations altogether. Miller & Miller (2010) surveyed 1,552 men and women over age 18 to determine differences in attitudes toward exercising at a gym between overweight (BMI > 25) and normal weight adults. The overweight respondents reported feeling more embarrassment and intimidation about exercising around fit individuals than did the normal weight respondents. Overweight women reported the most embarrassment about exercising in a health club. In terms of intimate relationships, Kolotkin et al. (2006) found that obesity was associated with lack of enjoyment of sexual activity, reduced libido, sexual performance difficulties, and avoidance of sexual activity
altogether. Obesity has also been linked to loud snoring which could potentially lead to increased marital stress (Troxel, 2010).

2.2.6 Environmental effects

Environmental wellness involves having the ability to protect yourself against hazards in your surroundings, having clean natural resources, and reducing waste and pollution (Insel & Roth, 2010). Hazardous chemicals present in the environment, such as pesticides and flame retardants, have been theorized to contribute to the obesity epidemic (McClafferty, 2008) by amplifying and extending inflammation within the body (Pelletier, Despres, & Tremblay, 2002) or interfering with normal thyroid functioning (Schecter, Papke, Tung, Staskal, & Birnbaum, 2004). Air pollution has also been implicated in the rise in obesity prevalence (Schell, Burnitz, & Lathrop, 2010). In particular, living in an area with high traffic density is associated with increased BMI. Jerrett et al. (2010) followed 3,318 California youths from age 10 to 18 and found that children living within 150 meters of dense traffic patterns had significantly elevated BMI levels compared to youths living at least 300 meters from traffic. Alternatively, children and youths living in greener areas generally have lower BMI scores (Bell, Wilson, & Liu, 2008). Living in an urban neighborhood with high crime rates and limited access to parks (i.e. non-“walkable” environs) has been shown to be associated with higher obesity levels for the inhabitants (Cutts, Darby, Boone, & Brewis, 2009).

Research from the field of industrial ecology shows that the average American diet follows what Duchin (2005) calls an “affluent consumption pattern”. That is, people in high income countries like the U.S. derive the majority of their daily calories from
refined carbohydrates and saturated fats with a significant contribution from meats and
dairy products. People in low income and developing countries follow the
“Mediterranean type pattern” and derive food energy mostly from fruits, vegetables,
breads, and monounsaturated fats with limited consumption of dairy and red meat. The
affluent consumption pattern requires far more natural resources to maintain than the
Mediterranean type pattern. Furthermore, as countries such as China continue to develop
economically, their consumption patterns may shift towards the American or affluent
pattern putting further strain on the planet’s natural resources. This shift in diet pattern,
coupled with rising global rates of obesity, may deplete natural resources to the point of
creating food shortages around the globe (Gerbens-Leenes, Nonhebel, & Krol, 2010).

2.3 Causes of Obesity

Obesity is a complex, multifactoral condition that ultimately results from an
individual’s inability to maintain energy balance. The majority of obese individuals
possess a daily energy surplus primarily due to lack of physical activity and unhealthy
used data from NHANES and the Coronary Artery Risk Development in Young Adults
(CARDIA) study to explain the relatively recent rise in obesity in the U.S. The authors
estimated that the average American accumulates an excess of 100 calories per day which
equates to roughly 1.8 to 2.0 pounds of added weight per year. It was concluded that
simple, daily lifestyle alterations, such as walking one mile or reducing portion sizes,
would be sufficient to burn the excess 100 calories, restore energy balance, and thwart the
rising rate of obesity in the U.S.
However, viewing obesity as solely an issue of a person’s inability to maintain energy balance is a gross oversimplification. Contributing risk factors include lack of opportunities to be physically active, eating meals away from home, excessive availability of energy-dense food, metabolic deficiencies, genetic predisposition, and low socio-economic status (Centers for Disease Control & Prevention, 2009d; Hill et al., 2003). Eating in response to stress may also contribute to obesity (Robbins & Fray, 1980). More recent discoveries have found novel risk factors for obesity, such as adenovirus 36 (Atkinson et al., 2005), malnutrition during fetal life (Barker, Osmond, Kajantie, & Eriksson, 2009), early intake of solid foods as an infant (Huh, Rifas-Shiman, Taveras, Oken, & Gillman, 2011), emotional eating in response to stress (Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009), and more time spent in thermal comfort (Johnson, Mavroggiani, Ucci, Vidal-Puig, & Wardle, 2011). Figure 2-1 from the Centers for Disease Control and Prevention illustrates several of the individual and societal factors that can influence energy balance.

In terms of genetic predisposition for obesity, several twin, adoption, and family studies suggest that between 25% and 40% of individual differences in body mass may depend upon one’s genes (Bouchard, Perusse, Leblanc, Trembley, & Theriault, 1988; Tambs et al., 1991; Vogler, Sorensen, Stunkard, Srinivasan, & Rao, 1995). Over 600 genes, genetic markers, and chromosomal regions have been identified that could potentially impact one’s proclivity to be obese (Perusse et al., 2005). Some of these genes lead to specific syndromes, such as Cushing’s, Down, and Prader-Willi that predispose the person to obesity (National Endocrine and Metabolic Diseases Information Service, 2008). Wardle & Carnell (2009) reviewed evidence of the genetic variability in
Figure 2-1: Factors that influence energy balance.


appetite as well and concluded that one’s ability to detect a sense of fullness after eating is highly heritable and highly associated with adiposity.

For some individuals, the craving for food may be stronger than “normal”. Grucza et al. (2010) recently showed a link between alcoholism and obesity. In this study, individuals with a family history of alcoholism also had elevated obesity risk. The researchers suggested that the foods Americans are eating may interact with the same brain structures as addictive drugs. The implication is that food may act like an addictive substance for some individuals. In a study comparing obese subjects with and without binge-eating disorder, Wang et al. (2011) demonstrated an increased dopamine release in the caudate area of the brain in response to food stimuli in obese individuals with binge-
eating disorder. This extra activity in the brain’s dopamine center may partially explain why some individuals are unable to control their food consumption and repeatedly fail at attempts to decrease food intake despite the negative health consequences of overeating (Gearhardt, Corbin, & Brownell, 2009).

The past few decades has seen a dramatic increase in sales and use of pharmaceuticals. The average annual growth in drug spending was 13.4% from 1995 to 2004 (Catlin, Cowan, Hartman, & Heffler, 2008). The top 10 selling drugs from 2002-2004 were (in order) Lipitor, Zocor, Plavix, Advair, Norvasc, Zyprexa, Paxil, Nexium, Zoloft, and Celebrex (Mangoon, 2005). In 2006, growth had slowed to 8.5% but the researchers believe that growth will regain momentum as the “baby boomers” reach retirement age and Medicare Part D takes full effect. By 2009, sales of prescription drugs in the U. S. topped $300 billion equating to approximately $1,000 per capita (IMS Health, 2010).

The use of prescription drugs, especially antidepressants, has been shown to be linked to weight gain and obesity. In a review of the literature on pharmaceutical-induced weight gain, Schwartz, Jindal, Virk, and Jones (2004) reported that the vast majority of mood stabilizers, antipsychotics, and antidepressants cause weight gain. Weight gain induced by the pharmaceuticals over the course of treatment (studies ranged in length from 4 weeks to 160 weeks) was drug-specific and ranged from 0-31 kg for antipsychotics, 1-15 kg for mood stabilizers, and 1-14 kg for antidepressants. U.S. sales of antidepressants rose 4% generating almost $10 billion in 2008 making them the fourth-largest class of prescription medicines by sales (IMS Health, 2010). Unless drug
formulation evolves to eliminate weight gain as a side effect, pharmaceutical-induced weight gain is likely to continue to be a significant contributor to population obesity.

Sleep deprivation has also been implicated in the rise in population obesity levels due to its effect on the endocrine system. For the past decade, Americans have been getting fewer hours of sleep per night on average (Knutson, Spiegel, Penev, and van Cauter, 2007). Getting less sleep has been shown to be associated with increases in body weight (Gangwisch, Malaspina, Boden-Albala, and Heymsfield, 2005), lower levels of the hormone leptin which is an appetite suppressing hormone (Chaput, Despres, Bouchard, and Tremblay, 2007), and higher levels of ghrelin which is an appetite stimulating hormone (Taheri, Lin, Austin, Young, and Mignot, 2004). In fact, increased levels of the hormone ghrelin along with intensified feelings of hunger have been shown to be associated with just one night of sleep deprivation (Schmid, Hallschmid, Jauch-Chara, Born, and Schultes, 2008). Additionally, Brondel, Romer, Nougues, Touyarou, and Davenne (2010) have shown that when healthy young men sleep 4 hours in one night compared to 8 hours, their caloric intake the following day increases 22% (an increase of roughly 560 calories). If sleep deprivation continues to rise in the U.S., its influence on obesity levels may rise concomitantly.

Not being breastfed as an infant seems have a detrimental effect in terms of the risk for becoming obese. In 2005, the IOM declared that infants who breastfeed have a lower risk of becoming obese later in life (Institute of Medicine, 2005b). The state of California was again “ahead of the curve” with its *Breastfeeding at Work and Lactation Accommodation* laws passed in 1998 and 2002, respectively. These laws afforded working moms adequate time and appropriate facilities for breastfeeding or pumping
breast milk (Shealy, Li, Benton-Davis, & Grummer-Strawn, 2005). The Navaho Nation passed a similar bill in 2008 (Fonseca, 2008).

It is evident that no one gene causes obesity and no one environmental factor triggers obesity. Obesity is a function of one’s genetic makeup and the environment in which those genes are expressed. Therefore, attempts at reducing obesity prevalence need to impact several risk factors at both the individual and environmental levels (Centers for Disease Control & Prevention, 2010). Whether genetic predisposition or environment contributes more to population obesity levels has yet to be determined. However, it has been noted that the recent substantial rise in obesity rates has occurred too quickly to be a result of significant genetic mutation, a process which takes centuries. Instead, the food environment in the United States has changed much more dramatically than the human genome in the past few decades (Grucza et al., 2010). It is now estimated that the foodservice industry serves 130 million meals every day in almost 950,000 locations which accounts for 49% of Americans’ food dollars outside the home (National Restaurant Association, 2011). Americans are inundated with advertising for unhealthy foods. Noted obesity researcher Marion Nestle (2006) points out that children in American spend almost $30 billion of their own money on food and companies are capitalizing on that behavior. Dr. Nestle notes that the Kellogg Corporation spent $22.2 million to market Cheez-It crackers in 2004. McDonald’s spent over $528 million during 2004 to promote its products. The Institute of Medicine (2005a) has reported that up to 30% of the calories in an average American youth’s diet derives from salty snacks, soft drinks, fast food, and sweets. Indeed, the marketing of junk food to children is a sensible business model that is geared towards ensuring future business for companies at the
expense of the public’s health. If marketing of unhealthy food is supported as a major contributing factor to the current obesity epidemic, policy level approaches may be required to stop the practice.

2.4 Policy and Public Health

Policy is a powerful modifier of personal behavior and is being called upon increasingly in obesity prevention efforts (McGinnis, Williams-Russo, & Knickman, 2002). As noted obesity policy researcher Kelly Brownell has stated, “There is a desperate need to broaden the discussion so that the central roles of economics, social conditions, and politics are addressed” (Brownell, 2005, p. 956). Consideration of policy domains when attempting to improve public health fits with ecological models of health behavior which considers environmental factors along with individual factors as essential to changing health behaviors (Sallis & Owen, 2002).

Indeed, the majority of the improvements in public health throughout the 1900’s have been attributed to policy measures, such as the fluoridation of drinking water, safer workplaces, motor vehicle safety, and childhood vaccinations (Insel & Roth, 2010). Policy victories are usually hard-fought and rarely straightforward. The history of childhood vaccinations in the U.S. provides a particularly interesting case study of the often precarious juxtaposition of public health and politics. The first vaccine for smallpox, created by Edward Jenner in 1796, was developed during an era when childhood mortality before age 5 was 20%. (Stern & Markel, 2005). There was obviously a public health need for a solution to the scourge of smallpox and vaccination seemed to be the answer. Despite the public health need and widespread success of smallpox
vaccination, by 1830 there had developed a determined anti-vaccination movement in the U.S. A common refrain from this group was that vaccination was an invasion of privacy. Some even believed vaccination to be analogous to blood-letting. The anti-vaccination movement never gained traction with the majority of Americans. In 1905 the U.S. Supreme Court ruled that obligatory small pox vaccination, which may trammel an individual’s right to privacy, was necessary for the “common good”. Today, the U.S. mandates a robust vaccination schedule in order for children to qualify for public schooling, although the anti-vaccination movement has remained vocal in the (recently debunked) connection between the measles, mumps, and rubella vaccine and autism (Godlee, Smith, & Marcovitch, 2011).

The palatability of policy approaches varies among individuals and is largely based on philosophical differences and on the health issue in question. Even health education professionals are split philosophically on the subject of the best approach for health promotion efforts: policy or individual level interventions. Welle, Russell, and Kittleson (1995) surveyed health education practitioners and academicians to gauge their philosophical beliefs toward health education activities. The researchers asked respondents to choose which of five health education philosophies they preferred:

1) Cognitive based – emphasize factual information and expansion of the health knowledge base of individuals
2) Decision making – teach systematic problem solving skills and how to apply skills to health decisions
3) Behavior change – emphasize self-monitoring, behavioral contracts, and goals setting with measurable objectives
4) Freeing/Functioning – help individuals make self-directed, autonomous health decisions
5) Social change – connect health education activities with the social, political, and economic environment
Results of a ranking exercise showed that the majority of both academicians and practitioners preferred individual-level philosophies to health education. Decision-making and behavior change ranked first and second, respectively, with social change (policy) ranking third.

Policy changes can have powerful effects on population obesity levels. In the case of restaurant menu labeling, Kuo, Jarosz, Simon, and Fielding (2009) estimated that as much as 40% of the 6.75 million pound annual weight gain seen among Americans could be eliminated if only 10% of restaurant patrons used the newly posted menu information to order reduced calorie meals. In the case of special taxes on snacks, soda, or fast food, substantial revenue could be generated while simultaneously reducing the consumption of these unhealthy food products. The revenue generated from these taxes could also be used in ancillary obesity prevention efforts (Brownell et al., 2009a).

However, taxation in any form remains a politically charged issue. Opponents might argue that the government should not be involved in the personal health habits of the American people or enact any legislation that unduly restricts freedom of choice. Proponents of the soda tax might reply that it is the government’s responsibility to battle obesity due to the failure of the companies selling soda to protect consumer health (Brownell, Chaloupka, & McGlaughlin, 2010).

Currently, there is a strong push for increased policy level approaches toward obesity-related issues. New York City is a leader in this regard with its successful implementation of a city-wide ordinance in 2006 requiring chain restaurants to post calorie information on menus, menu boards, and item tags (Farley, Caffarelli, Bassett, Silver, and Frieden, 2009). The effectiveness of New York City’s ordinance, along with
reports promoting menu labeling from the Center for Science in the Public Interest (Center for Science in the Public Interest, 2003) and an FDA Obesity Working Group (FDA, 2004) provided much of the impetus for the nutrition labeling provision included in the Patient Protection and Affordable Care Act of 2010 (Nestle, 2010). Several other obesity prevention provisions were included in the Affordable Care Act such as creation of the National Prevention, Health Promotion and Public Health Council, the Prevention and Public Health Fund, the National Diabetes Prevention Program, and continued funding for the Childhood Obesity Demonstration Project that was created under the Children’s Health Insurance Reauthorization Act of 2009 (Levi, Vinter, St. Laurent, & Segal, 2010).

2.5 Government, Obesity, and the Free Market

Determining when policy level approaches to health problems are warranted is complicated. In their book *Governing Health: The Politics of Health Policy*, Weissert & Weissert (2002) describe three steps to the policy process: problem definition, solution creation, and political feasibility. The first step, problem definition, includes determining how the problem is measured and linking the problem to its root cause. Attributing cause is a plastic concept. Historically, being obese was considered a failure of willpower on the part of the individual. Now that as many as one-third of Americans are obese, there is increased acceptance of the obesogenic environment that exists in the U.S. as a cause for obesity. Goel, McCarthy, Phillips, and Wee (2004) used self-reported height/weight data on 32,374 respondents from the 2000 National Health Interview Survey to show that the number of years lived in the U.S. by immigrants was associated with higher BMIs. The
prevalence of obesity among immigrants who had lived in the U.S. for less than 1 year was 8%. After living in America for 15 years, the prevalence of obesity among immigrants was 19%, which approached that of U.S. born citizens in the year 2000 (22%). This finding lends credence to the notion that being obese is not merely a personal failing but is due, in large part, to overwhelming environmental pressures that are out of one’s control. However, in the political realm, scientific evidence is a valuable commodity but is not sufficient to guarantee support for an issue. Stone (1989, p. 297) expresses the relationship between science and politics in this quote:

“Finding the true or ultimate cause of harms in these policy areas is not what is at issue. Rather, the fight is about locating moral responsibility and real economic costs on a chain of possible causes. The location is dictated more by the political strength of different groups (tobacco growers, the gun lobby) than by any statistical proof or causal logic.”

The second phase in the policy process is determining if the problem warrants a public (i.e. government) or private solution. Implicit in this decision is one’s view of the proper role of government. Ordinarily, liberal leaning individuals favor more government intervention to solve social problems while conservative minded persons believe that an unfettered private sector will produce superior solutions to government approaches (Weissert & Weissert, 2002).

The United States is founded on the principle of individual liberty. Government intrusion into the private lives of Americans is (and should) be viewed with skepticism. Some view the Patriot Act ratified by President George W. Bush as an example of too much government involvement into the personal lives of Americans (American Civil Liberties Union, 2011). Government intrusion into personal habits, such as drinking alcohol and smoking cigarettes, has been met with stiff resistance in the past even in the
face of scientific evidence that the private habits in question harm others (Kersh & Morone, 2002). Opponents of obesity prevention measures may argue that personal dietary and physical activity habits harm only the owner of those habits. Other philosophers have argued that paternalistic government actions, such as laws requiring seatbelt use and speed limits, are warranted to help those who lack willpower to prevent personal harm (Kersh & Morone, 2002). Furthermore, the rise of obesity has been blamed by some on failure of the free market to protect consumers’ health (Brownell, Chaloupka, & McGlashlin, 2010). If it can be convincingly demonstrated that the market has failed to protect consumers from obesity, government intervention may be better received by the public.

Some ideologues feel that government intervention into private matters is defensible only when there is clear evidence of market failure. The Great Depression is a classic example of market failure leading to increased acceptance of government involvement in the form of New Deal legislation like the Social Security Act and Fair Labor Standards Act (United States Department of State, 2008). Recent years have seen similar, unprecedented acceptance of governmental assistance to combat market failures as evidenced by the 2008 Emergency Economic Stabilization Act (United States Department of the Treasury, 2011a) and the American Recovery and Reinvestment Act of 2009 (United States Department of the Treasury, 2011b). Interestingly, the Recovery Act included funding for the Communities Putting Prevention to Work initiative which “aims to improve access to healthy foods and opportunities to be physically active by helping communities change systems and environments” (Levi, Vinter, St. Laurent, & Segal, 2010).
Once it has been established that the problem in question lends itself to a public solution, the third phase of the policy process involves determining the political feasibility of the public solution. Policymakers need to consider all the costs implicated in policy change, including how the measure will be funded and what amount of political capital (i.e. constituent and colleague support) will be necessary to champion the measure through the policy process. Political feasibility is also influenced by the timing of the proposed measure in relation to election cycles, saliency of the issue from the public and media viewpoint, and institutional factors such as Governor support and lobbyist activities. Historically, public support for an issue has been shown to influence legislator behavior the most because the voters are responsible for ensuring reelection (Fenno, 1973). However, the influence of lobbyists and special interest groups has grown markedly (Austen-Smith & Wright, 1994). Recent polls have shown strong public support for government action on obesity, especially in the realm of advertising unhealthy foods to children (Evans, Finkelstein, Kamerow, & Renaud, 2005).

Successfully framing the issue of obesity as a public issue and not a personal issue will be paramount for garnering support for prevention measures (Saguy & Riley, 2005). Due to its exceptionally high prevalence, obesity has never been more at the forefront of public conversation in the U.S. than it is today. A 2004 public poll found that the vast majority of the respondents viewed obesity as a public matter and an issue that society must address (Lawrence, 2004). A study by Taylor, Funk, and Craighill (2006) found that 90% of the public believes that the majority of Americans are overweight and are discriminated against because of their condition. Public opinion polls have also shown that 54% of Americans favor taxing unhealthy food, 73% support restricting children’s
food advertising, and 69% support soft drink/snack food bans in schools (Brownell, 2005). Public support for such policies may bode well for the election hopes of legislators or those who are able to craft politically palatable measures and champion those measures through the policy process.

2.6 The Tobacco Model

Beginning with the 1964 U.S. Surgeon General report causally linking smoking to lung cancer and bronchitis (Office of the Surgeon General, 2007), much of the public health success against tobacco use has come from policy measures such as public smoking bans and taxation of cigarettes. Insight into potential policy approaches to reducing obesity may be gleaned by examining the “playbook” used by “Big Tobacco” (Brownell & Warner, 2009c). Perhaps the most egregious “play” used by Big Tobacco was the blatant disregard for the health of U.S. children that the tobacco industry exhibited. Marketing tobacco products to children and teens through the use of cartoon characters like “Joe Camel” became a proven revenue generating method for Big Tobacco during the 1970’s and 1980’s. Marketing unhealthy products to youths eventually lead to the “Master Settlement Agreement” in 1998. This lawsuit forced the four largest tobacco companies to pay over $200 billion dollars to 48 states for damages related to tobacco use. The agreement also banned youth access to free tobacco samples, prohibited advertising of tobacco products to youths under 18 years of age, and banned the use of cartoons. In return, Big Tobacco was granted immunity against future health-related lawsuits (State of California Department of Justice, 2011).
Many experts believe that Big Tobacco received a favorable ruling in the Master Settlement because of the future immunity clause. Research into the marketing behavior of tobacco companies immediately following the settlement concurs. King & Seigel (2001) analyzed advertising expenditure trends for the top youth brands of cigarettes in youth-oriented magazines between 1995 and 2000. The researchers discovered that expenditures for youth-brand cigarettes in youth-oriented magazines actually increased following the Master Settlement going from $56.4 million in 1995 to $59.6 million in 2000. The Settlement’s proviso of prohibiting advertising to youths was seemingly ignored by the tobacco industry in favor of profit motives. This suggests that, when market forces work to profoundly degrade the public’s health, leveling lawsuits against the primary offending companies amounts to a “slap on the wrist” and provides insignificant impetus for change especially when the companies are powerful and profitable.

According to the IOM, promotion of healthy foods by the food industry itself has historically fallen far short of its potential (Institute of Medicine, 2005a) prompting some experts to call for increased regulation of food advertising by the Federal Trade Commission (Mello, 2010). This does not bode well for recent industry-sponsored initiatives aimed at helping consumers make healthier purchasing decisions, such as the front-of-pack nutrition labeling system “Nutrition Keys” developed by the Food Marketing Institute and Grocers Manufacturers Association (2010) and the Clear on Calories labeling system developed by the American Beverage Association (American Beverage Association, 2011). The IOM has also suggested that, if the food industry fails to self-impose effective practices in relation to promoting healthy foods, corrective
legislation by Congress may be warranted. Implicit in the IOM’s stance is the message that corrective legislation is an effective approach for changing the profiteering behavior of companies. Past lawsuits, such as the ones filed against Kellogg and McDonald’s (Bloomberg News Service, 2005) have prompted 24 states to pass laws granting restaurants, food manufacturers, and marketing firms immunity from lawsuits brought by obese individuals (Levi, Vinter, St. Laurent, & Segal, 2010). While a lawsuit forces a company to acknowledge an alleged indiscretion and remedy events of the past, a new law forces that company to operate in a changed environment and helps prevent indiscretion in the future.

The power of legislation to favorably affect the public’s health is evident. The World Health Organization credits laws that impart heavy taxes on cigarettes as having the most effect on reducing tobacco use (World Health Organization, 2008). Additional evidence of the power of policy approaches can be seen from New York City’s tobacco control program implemented in 2002. Researchers have estimated that a tax increase from $0.08 to $1.50 per pack of cigarettes along with enactment of the Smoke-Free Air Act helped lead to approximately 140,000 fewer smokers in New York City from 2002 to 2003 (Frieden et al., 2005). The lesson to be learned from the tobacco model is that policy measures worked to drastically reduce the prevalence of a major threat to the public’s health and the impetus for change came from focusing on the health of children. Policy measures to reduce population obesity could have a similar positive impact for millions of Americans and, much like the tobacco model, measures that resonate loudly with the public focus on protecting the health of children.
2.7 Individual-Level Obesity Reduction Strategies

Experts have proposed a plethora of strategies at both the policy and individual levels aimed at reducing obesity in the U.S. Individual approaches to obesity reduction typically focus on personal responsibility and utilize a protective health behavior approach such as increasing exercise and improving nutrition. Surgical and pharmaceutical interventions are additional approaches some individuals take to reduce BMI. The strategies that follow are popular, individual focused approaches aimed at reducing obesity.

2.7.1 Behavioral approaches

Everyone has to eat, but the U.S. food industry produces twice as many calories for its adult populace than would be necessary to maintain a healthy weight (Nestle, 2003). The cost of calorically dense food can be relatively inexpensive as well. Consider that the McDonald’s 50 piece chicken McNugget contains 2300 calories and costs $9.99. That equates to 230 calories for less than $1 which is a slightly lower calorie-to-cost ratio than the 280 calories provided by an $0.80 Snickers candy bar. Despite such abundant, appetizing, and affordable food, calorie restriction, reduced fat intake, and portion control have become popular approaches to combat or reverse weight gain. French, Jeffery, and Murray (1999) followed 1120 U.S. adults over a four year period to determine the prevalence and composition of weight loss strategies. Seventy-nine percent of the participants reported decreasing fat intake, 78% reduced food portion size, and 73% lowered total calorie intake at least once during the four year trial. Over 70% of the participants reported using all of the weight loss strategies listed above at least once
during the four year study. Annual BMI testing showed that participants who engaged in at least one of the weight loss strategies listed above for at least 49 out of the 208 week study period gained an average of 0.5 pounds. Participants who engaged in none of the strategies gained an average of 5.0 pounds over the duration of the study.

The United States Department of Agriculture (USDA) and Department of Health and Human Services have issued the *Dietary Guidelines for Americans* every five years since 1980 in hopes of educating the populace about healthy food choices (Nestle, 1998). The most recent version released on February 1, 2011 highlights the importance of eating fruits, vegetables, whole grains, and low-fat milk (United States Department of Agriculture & United States Department of Health and Human Services, 2011). The latest edition also stresses the importance of physical activity for successful weight management. Some experts are skeptical of the apparent conflict of interest that may exist with the USDA simultaneously promoting U.S. agricultural products, like beef, and public health (Nestle, 1993; Nestle, 2003). The prevalence of obesity has more than doubled since the introduction of the *Dietary Guidelines for Americans* in 1980. Health educators have long known that simply educating the public on healthy food choices, while necessary, is insufficient for behavior change (Glanz, Rimer, & Lewis, 2002; McLeroy, Bibeau, Steckler, & Glanz, 1988).

The USDA guidelines are formulated with diet quality as the goal, not weight loss. Popular diets geared toward weight loss include the Atkins, Ornish, Weight Watchers, and Zone diets. Dansinger, Gleason, Griffith, Selker, and Schaefer (2005) found that after one year all of the aforementioned diets reduced body weight modestly in 160 participants while also reducing several cardiac risk factors. However, adherence to
the diet regimens was low overall. Physician referral to weight loss programs may be a method for increasing adherence and improving long-term weight loss results. Ahern, Olsen, Aston, and Jebb (2011) found that patients referred to Weight Watchers by their family physician lost twice as much weight as patients who received care. In a separate study, Larsen et al. (2010) followed 773 adults who were randomly assigned to either a high-protein, low glycemic-index group or low-protein, high-glycemic index group to notice maintenance of weight loss. They found that more participants in the high-protein, low glycemic-index group completed the study and showed better results in terms of long-term weight loss maintenance. These results conflict with the findings from Kennedy, Bowman, Spence, Freedman, and King (2001) which showed that individuals on high carbohydrate, low fat diets acquire more essential nutrients and maintain lower BMI values than people on low carbohydrate diets. Kennedy et al. also concluded that any diet that creates a caloric deficit will result in weight loss.

Individuals often supplement their existing diet with compounds found to be beneficial for weight loss. Caffeine consumption has been implicated in successful weight loss and weight maintenance (Hursel, Vichtbauer, Westerterp-Plantenga, 2009) as has calcium supplementation (Anderson & Moore, 2004; Major, Alarie, Dore, Phouttama, & Tremblay, 2007). In 2011, Wang et al. showed that the compound reservatol found in grapes helps stimulate the expression of adiponectin, a regulator hormone that affects body fat storage, which adds to the research supporting the health benefits of a daily glass of red wine.

In terms of exercising for weight maintenance, the American College of Sports Medicine and the CDC recommend that every American accumulate at least 30 minutes
of moderate-intensity physical activity on most, preferably all, days of the week (Pate et al., 1995). According to the Institute of Medicine (IOM) individuals may need to engage in as much as 90 minutes of physical activity every day to lose weight (Institute of Medicine, 2002). During the four year Pound of Prevention study, 82% of the adult participants tried increasing physical activity levels in order to lose weight (French, Jeffery, and Murray, 1999). Despite attempts at increasing physical activity levels, these 918 individuals gained an average of 0.5 pounds by the end of the study.

Many individuals who are trying to lose weight will employ a combination of strategies such as exercise, nutrition, supplementation, and personal trainers. Unfortunately, these strategies have also been of limited value in achieving lasting weight loss (Miller, 1999). Sallis and Glanz (2009) summed up the situation best by stating “Diet and physical activity interventions that build knowledge, motivation, and behavior change skills in individuals without changing the environments in which they live are unlikely to be effective” (p. 126). More evidence of the failure of diet and exercise approaches to produce lasting weight loss results comes from Skender et al. (1996). The authors followed participants of three types of weight loss interventions (diet only, exercise only, and diet with exercise approaches) for two years to determine the most efficacious method for maintaining weight loss. It was found that dieting alone resulted in initial weight loss followed by regain after treatment termination. Exercise only yielded less weight loss but better long term weight loss maintenance.

Unsuccessful weight loss may be due to a perceived lack of control over eating and food dependence (Goodrick & Foreyt, 1991). When the individual feels helpless to lose weight, enlisting the aid of health care providers may be of limited value. Physicians
have reported that they do not have the time, training, nor reimbursement plan necessary to treat obese patients adequately (Campbell, Engel, Timperio, Cooper, & Crawford, 2000). A relatively new approach to gaining professional support for weight reduction efforts is the use of telephone coaching. Tucker, Cook, Nokes, and Adams (2008) delivered eleven 30-minute telephone coaching sessions and a dietary supplement to 120 obese men and women ages 25-60 over the course of a 17 week study period to determine the effects of diet and exercise coaching and weight loss supplementation on body composition. The authors stated that both treatments, coaching and supplementation, helped participants lose weight with the greatest weight loss coming from individuals who received both coaching and supplementation. However, the authors did not follow the participants after the study to determine if the weight loss success was transient or lasting.

2.7.2 Pharmacotherapy and surgery

Due to the ineffectiveness of behavioral approaches to losing weight, many individuals turn to medicinal or surgical methods for help. Drug therapies for obesity fall into four main categories based on the action of the drugs: food intake reducers, thermogenesis aids, food absorption inhibitors, and hormonal therapies (Lobstein, Baur, & Uauy, 2004). A review of placebo – controlled clinical trials by Leung, Thomas, Chan, and Tomlinson (2003) provides evidence in favor of the drugs Orlistat and Sibutramine. Orlistat reduces fat absorption through the inhibition of enzymes that help break down fat in the gastrointestinal tract. Sibutramine is an appetite suppressor. The article found that individuals who use these drugs during and after behavioral approaches
to weight loss (i.e. diet and exercise) were more likely to maintain their weight loss results long term. However, as with almost all drugs, there were side effects. Some individuals who took Orlistat experienced adverse gastrointestinal events while Sibutramine use was associated with dry mouth and insomnia. These side effects seem tame compared to those of the anti-obesity drug Rimonabant. Most of the individuals involved in the clinical trials of Rimonabant in 2008 showed improvements in weight and lipid profiles but other participants experienced severe neuropsychiatric events, including suicide (Topol et al., 2010). Outcomes such as this has not dampened pharmaceutical companies’ drive to find the “magic bullet” for obesity. Jandacek and Woods (2004) searched the U.S. patent office database for patents issued between 2001 and 2004 with the word obesity in the abstract. They discovered that 171 had been issued in that time period.

Surgical intervention for weight loss is becoming a more popular approach for morbidly obese individuals when other methods like behavioral and pharmaceutical approaches fail. Zizza, Herring, Stevens, and Carey (2003) found a significant increase in bariatric surgeries from 1990 to 2001. Weight loss surgeries will likely grow in number due to recent recommendations from the FDA. An FDA advisory committee voted 8 to 2 to recommend that individuals with a BMI over 30 should consider the “Lap band” procedure (United States Food & Drug Administration, 2010). Previous guidelines stated that the Lap band procedure was indicated only in individuals with a BMI over 40. The committee decided that the risks of having the Lap band procedure were outweighed by the health risks associated with having a BMI above 30. It is interesting to note that the FDA committee that produced the new guidelines was chaired by a physician who owns
stock in the company Allergan (maker of the Lap band device). Other surgical procedures for reducing morbid obesity include Roux-en-Y gastroenterostomy, biliopancreatic bypass, long-limb gastric bypass, and vertical-banded gastroplasty (Insel & Roth, 2010).

2.8 Policy-Level Obesity Reduction Strategies

While individual approaches to obesity reduction highlight the importance of personal responsibility, policy strategies acknowledge and amend the environmental drivers of obesity. In their 2009 report, Khan et al. outlined 24 potential policy-related strategies that communities can pursue to reduce population obesity levels (Figure 2-2). The recommendations from Khan et al. were organized into six categories in the official report published by the CDC (Centers for Disease Control & Prevention, 2009h). For the purposes of this study, the six categories were condensed into the following four topics:

1. Obesity policy in public schools and community settings
2. Menu labeling
3. Taxation
4. Advertising

2.8.1 Obesity policy in public schools and community settings

Increasing the availability of healthy foods and drinks and/or reducing the availability of unhealthy foods and drinks within public schools is one approach communities have taken to reduce obesity levels. For example, in 2008 New York City set nutrition standards for all foods sold in schools. The new healthy standards called for
Potential Policy – Related Obesity Reduction Strategies

1. Increase availability of healthier food and beverage choices in public service venues.
2. Improve availability of affordable healthier food and beverage choices in public service venues.
3. Improve geographic availability of supermarkets in underserved areas.
4. Provide incentives to food retailers to locate in and/or offer healthier food and beverage choices in underserved areas.
5. Improve availability of mechanisms for purchasing foods from farms.
6. Provide incentives for the production, distribution, and procurement of foods from local farms.
7. Restrict availability of less healthy foods and beverages in public service venues.
8. Institute smaller portion size options in public service venues.
9. Limit advertisements of less healthy foods and beverages.
10. Discourage consumption of sugar-sweetened beverages.
11. Increase support for breastfeeding.
12. Require physical education in schools.
13. Increase the amount of physical activity in physical education programs in schools.
15. Reduce screen time in public service venues.
16. Improve access to outdoor recreational facilities.
17. Enhance infrastructure supporting bicycling.
18. Enhance infrastructure supporting walking.
19. Support locating schools within easy walking distance of residential areas.
20. Improve access to public transportation.
22. Enhance personal safety in areas where persons are or could be physically active.
23. Enhance traffic safety in areas where persons are or could be physically active.
24. Participate in community coalitions or partnerships to address obesity.

Figure 2-2. Policy-related strategies to reduce population obesity levels.


Increasing the availability of fruits and vegetables, reducing the availability of deep fried items, using less salt in food options, and increasing fiber content of menu items (New York City Mayor’s Office, 2008). The healthy standards also applied to community settings such as senior centers, child care centers, jails, parks, and homeless shelters. The
New York City Department of Health also promotes affordable healthy foods by operating the Health Bucks Program which gives food stamp recipients monetary incentives for spending their stamps at their local farmer’s market (New York City Department of Health and Mental Hygiene, 2007).

Jefferson Elementary School in California utilized its local farmer’s market to procure fresh produce for students. In 2005, the school opened up a salad bar stocked with fresh fruits and vegetables from two family farms near the area. The program was popular enough to warrant expansion to four additional elementary schools within the district (Anupama, Kalb, & Berry, 2006). Renovating school and community playgrounds has also been recommended as a method for increasing youth physical activity levels (Health et al., 2006).

Within the community setting, there have also been attempts to increase the number of supermarkets in underserved areas. Philadelphia used $67 million in public funds to encourage supermarket development in underserved neighborhoods (Burton & Duane, 2004) while Hartford, Connecticut created a new bus route to help residents in low-income neighborhoods reach the supermarket in less time (McCann, 2006). Encouraging food retailers to build stores in underserved areas can also take the form of tax incentives like the city of Richmond, California gave to a grocery retailer to encourage construction of a market next to an affordable housing development (PolicyLink & Bay Area Local Initiatives Support Corporation, 2008).

Creating opportunities for pedestrians and bicyclists to walk and ride on neighborhood streets with minimal environmental hazards is essential to obesity reduction efforts within community settings. Health et al. (2006) conducted a systematic
review of the effectiveness of urban design and land use and transport policies on increasing physical activity of community members. The researchers concluded that policies improving access to physical activity-friendly locations within communities and policies that guide urban design and land use toward reducing physical inactivity show much promise for obesity reduction efforts. The authors highlighted improved lighting, more pleasing aesthetics, traffic calming measures, wider sidewalks, median strips, and more benches as ways to support pedestrian and bicyclist friendliness. As with any new policy decision, thorough consideration of all the potential consequences needs to be contemplated prior to implementation to ensure that the new policy does not actually increase the chance of injury to pedestrians and bicyclists.

2.8.2 Menu labeling

Some communities, such as New York City, have taken the approach of requiring restaurant chains with 15 or more locations to post calorie information at the point-of-purchase (New York City Department of Health and Mental Hygiene, 2006). The idea is that informed consumers will make healthy food and beverage choices. However, some evidence has shown that restaurant menu labeling alone may not have a major impact on population obesity levels. Finkelstein, Chan, and Krieger (2011) researched the effect of a caloric content disclosure at the point of purchase for restaurants with 15 or more locations in King County, Washington. The authors discovered that consumer purchasing habits for one fast food chain (Taco time) in King County had not changed 13 months after the regulation went into effect. The researchers concluded that other interventions that work in concert with calorie labeling may be needed to impact
population obesity levels. This finding echoes concerns of other researchers who question the ability of disclosure of calorie information alone to affect the dining habits of patrons. In accordance with the expectancy-disconfirmation paradigm, Burton, Howlett, and Tangari (2009) believe that menu labeling will reduce calorie intake only when the calorie information presented is less favorable than expected. Confirmation that a food item is high in calories may not stop a patron from consuming that item if they already knew it was calorically dense. However, the King county study included data from only one fast food outlet in one county. Different results may be found for other locations and chains. It is important to note that the Affordable Care Act mandates menu labeling for restaurant chains of 20 or more (Nestle, 2010).

2.8.3 Taxation of unhealthy foods and beverages

Taxation of sugared beverages and taxation of snack foods are approaches several communities and states have taken to support healthy food and beverage choices (Trust for America’s Health, 2009). Taxation of snack foods and sugared beverages might have a two pronged effect: higher prices may curtail consumer purchases of these unhealthy items while the revenue generated from the tax could be used to fund community-based obesity prevention programs (Brownell et al., 2010). Sugared beverages are an excellent candidate for taxation because they contribute, on average, over 300 unnecessary calories per day to the diets of American children (Wang, Bleich, & Gortmaker, 2008). Moreover, a review of 160 studies from the past 70 years pertaining to the demand for various foods and drinks showed soft drinks and juice to have the second and third highest price elasticity, respectively (Andreyeva, Long, & Brownell, 2010). Only food
away from home had higher price elasticity. Eggs had the lowest price elasticity. High price elasticity indicates that the demand for that particular product will decrease sharply as price increases. A study by Brownell et al. (2009a) suggests that a penny per ounce tax on sugared beverages could reduce consumption by 20% and raise $150 billion over ten years. Such outcomes could have a significant public health impact while providing funding for additional obesity prevention programs.

However, there are several controversies with taxation of snack foods and sugared beverages. It has not been conclusively demonstrated that such a tax would reduce population obesity levels at all. A definition of what constitutes a “sugared beverage” or a “snack food” would have to be agreed upon by legislators and industry leaders. In addition, all parties would need to decide if the tax to be levied is an excise tax or a sales tax. An excise tax has been suggested as the preferred method because consumers would notice the price increase on the product itself (i.e. “sticker shock”) as opposed to a sales tax where the increased cost being imposed after-the-fact on the sales receipt (Brownell et al., 2010). Furthermore, public support for taxation of any kind is generally low. Applying the revenue generated from taxes on sugared beverages and snack foods toward childhood obesity prevention efforts has been found to increase the public acceptance of such measures (Cawley, 2008; Oliver & Lee, 2005). Taxation of other unhealthy food items, such as fast food, has not been endorsed to date.

2.8.4 Advertising of unhealthy foods and beverages

A cursory walk through any local supermarket shows that the food industry, like Big Tobacco, uses cartoon characters such as Dora the Explorer, Spongebob Squarepants,
and Cookie Monster to market unhealthy products to children. Advertisement of a free toy in the McDonald’s Happy Meal is a classic example of a company’s ability to tailor a product to a child’s sensibilities. In 2007, the Federal Communications Commission (via the Fairness Doctrine) called for 44 food and beverage companies to disclose their marketing practices geared towards children (Dietz, Benken, & Hunter, 2009). It was found that over $1 billion was spent on direct marketing to adolescents. McGinnis, Gootman, and Kraak (2006) estimated the cost of direct and indirect marketing of food and beverage products to children to be $10 billion. The Kaiser Family Foundation estimates that the average American child age 8-12 years watches 21 food commercials each day (Kaiser Family Foundation, 2007). On December 1, 2010, San Francisco became the first major U.S. city to pass a law requiring kid’s meals to meet specific nutrition standards (e.g. contain less than 600 calories) in order to be sold with a toy (Reuters, 2010). Not surprisingly, the National Restaurant Association and McDonald’s Corporation were opposed to the new legislation.

Some states have addressed historically high obesity levels by filing lawsuits against the plausible offending companies. In 2006, the state of Massachusetts sued Kellogg and Viacom to keep them from promoting junk food to children (Center for Science in the Public Interest, 2006). The lawsuit was dropped after Kellogg announced plans to adopt nutrition standards to limit trans fats, sodium, and total calories in foods targeted towards children under 12 years of age (Center for Science in the Public Interest, 2007). However, food advertising to youths was not explicitly banned as it is in Australia (Nestle, 2006). Sweden and the Netherlands also ban advertising of unhealthy food products to youths under 12 years of age. It may be no coincidence that these three
countries maintain lower childhood obesity levels than the U.S. Additionally, Kellogg is responsible for enforcement of the new nutrition standards which some observers would argue amounts to “the fox guarding the hen house”.

2.9 State Legislator Research

The Tenth Amendment to the U.S. Constitution grants to the states all powers not reserved for the federal government. Therefore, the states have a great deal of influence over matters involving schools, roads, policing, taxation, and the public’s health (Weissert & Weissert, 2002). States have broad authority to enact legislation as long as there is not a superseding Federal law in existence (Brownell, Chaloupka, & McGlaughlin, 2010). For example, The Fitness Integrated with Teaching Kids (FIT) Act was introduced in the 111th Congress. If passed, the Act would amend the Elementary and Secondary Education Act of 1965 to upgrade K-12 physical education. This Act would usurp any pending State measures (Duderstadt, 2009).

Like the federal government, all 50 state governments include an executive, legislative, and judicial branch. The legislative branch is made up of popularly elected officials who create legislation and approve the state’s budget. All but one state legislature (Nebraska which has only one chamber) is made up of a smaller upper chamber (called Senate) whose delegates generally serve a four-year term and a larger lower chamber (called House of Representatives, Assembly, or House of Delegates) whose members typically serve for two years. According to the National Conference of State Legislatures, as of January, 2011 there were approximately 7,328 state legislators in the 50 states (National Conference of State Legislatures, 2011).
There is a dearth of research pertaining to state legislators’ perceptions of health and wellness-related issues. Health-related topics that have been researched using survey methods with state legislators include water scarcity (Ingram, Laney, & McCain, 1979), environmental policy (Bowman & Maggiotto, 1981), tobacco control (Flynn et al., 1997), and crime (Flanagan, Cohen, & Brennan, 1993).

2.9.1 Legislator voting behavior

Despite the assertion made by Stigler (1971, p. 3) that characterizes politics as “an imponderable, a constantly and unpredictably shifting mixture of forces of the most diverse nature…” there have been numerous models proposed that attempt to explain legislator voting behavior. The most well-known voting model proposed by Downs (1957) suggests that, in order to win an election, legislators should adopt a stance identical to the position of the median voter in that legislator’s jurisdiction. Some political scientists have suggested that Downs’ model no longer fits within the political climate in America because it fails to account for the significant polarization of politics and the marginalization of the average voter that has occurred since the 1960’s (Fiorina, 1999).

Kingdon’s (1977) review of the literature lead to several categories of voting theories: cue-taking, policy dimensions, predisposition-communication, consensus, past behavior, and goals. Cue-taking theory suggests that legislators, through membership on committees, develop specialized knowledge in key areas such as health, transportation, education, etc. When faced with a political issue that is outside their area of expertise, legislators look towards colleagues who do have specialized knowledge within the issue.
area and vote according to the cues being conveyed by the specialists. Policy dimensions
theory builds upon cue-taking theory by incorporating the notion of issue specificity.
That is, the legislator takes voting cues from only the most salient sources (e.g. party line,
constituents, the state’s governor). The salient sources may change depending on the
nature of the legislation in question. Predisposition-communication theory argues that
legislators first consider their “gut reaction” (predisposition) to the legislation by
considering how the bill would affect constituents, the party stance, and past personal
voting behavior. If the legislator does not possess a strong enough predisposition on the
issue to inform a voting decision, they engage in a communication process with
colleagues to determine how to vote on the issue.

Bender and Lott (1996) reviewed more current models and found several
explanations of the decision making processes involved in voting behavior. Overall, the
authors concluded that legislators overwhelmingly vote in a manner that is congruent
with the interests of their constituents. When legislators diverge from constituent
attitudes, they are often voted out of office. The most likely forces that cause legislators
to vote against the wishes of their constituents are personal ideological differences and
contributions from special interest groups.

In terms of applicable health behavior theories, Flynn et al. (1997) tested the
ability of the Theory of Planned Behavior to predict state legislators’ votes for or against
cigarette tax increases in the state of Vermont. The authors interviewed 170 members of
the Vermont House and Senate in the fall of 1994 to gauge voting intentions and
perceived behavioral control over voting prior to the introduction of a bill increasing the
state’s cigarette tax in the spring of 1995. After the bill was introduced, actual legislator
votes were recorded and compared to the legislators’ stated intentions to vote for the measure. Of the legislators who had high intentions to vote for the bill, 81% followed through with a yes vote. Alternatively, 69% of legislators who had low intentions of voting for the bill voted no. The relationship between voting and intention was stronger for Democrats than Republican party members. Adding perceived behavioral control over voting to the analysis resulted in a stronger association between intentions and voting for those with high perceived control compared to those with low perceived control. Multiple logistic regression showed only party affiliation and voting intentions to be significant predictors of voting behavior, not legislator age, gender, or current tobacco use. The authors concluded that the Theory of Planned Behavior was a useful model for investigating legislative decision making.

2.9.2 Response rates

According to their review of 73 surveys, Maestas, Neeley, & Richardson (2003) reported that surveys of state legislators have historically garnered response rates of 60-80% while mailed survey techniques yield 40-50% response rates. Keeping the survey between two to three pages and contacting the respondents more than once increased response rates to over 50%. The average mail survey included 21 states.

Chamber distinctions are a common selection criteria for surveys with more studies (70%) focusing on lower chambers than upper chambers (50%). Other selection criteria included gender, committee membership, and leadership status.
2.9.3 Support for obesity reduction measures

Mello, Studdert, and Brennan (2006) used the Health Promotion Program state legislation and statute database maintained by the National Conference of State Legislatures to compile a list of obesity prevention bills introduced by state legislators between 1998 and 2005. Their analysis of legislation impacting the school environment uncovered 105 bills introduced to address physical education requirements and funding of which 20 were enacted. The next most popular form of school based legislation was vending machine restrictions with 10 bills enacted out of 55 introduced. Nutrition education requirements and funding (23 introduced, 10 enacted), nutrition standards of cafeteria food (20 introduced, 7 enacted), and outreach to parents (5 introduced, 2 enacted) were also a part of the legislative mix for the school environment over that time period. Measures intended to combat obesity at the community level were also compiled. The most popular approach were bills to create a task force or institute to address community-level causes of obesity (70 introduced, 20 enacted). Improved safety for walking and biking (43 introduced, 6 enacted), community fitness campaigns (20 introduced, 15 enacted), and taxation of non-nutritious foods (23 introduced, 2 passed) were also introduced. Out of both school based and community based bills, the type of legislation most likely to pass was community fitness campaigns with a 75% success rate. The least successful were measures designed to tax unhealthy foods with an 11.5% success rate. Overall, community-based bills were more common and stood a better chance of making it all the way through the policy process (279 introduced, 79 enacted, 28% success) compared to school-based measures (242 introduced, 54 enacted, 22% success).
State legislator involvement in obesity prevention policy has ratcheted up since 2005. Duderstadt (2009) reported that 25 states have set standards for the nutritional value of food sold in school vending machines and stores, 18 states have adopted policies that require food served in school cafeterias to surpass the USDA guidelines, and 17 states have requirements for schools to screen and report on students’ weight-related statistics like BMI. All 50 states have set physical education standards for elementary and secondary school, but only 13 states included enforcement language in the legislation. Outside of the school environment, 17 states have instituted a tax on foods of minimal nutritional value, although some of those states have repealed that legislation in the face of heavy campaigning from the snack food industry. Eleven states have considered new regulations to ensure pedestrian and bicyclist safety, 12 states passed measures to help connect growers of fresh produce with local food service directors in schools (i.e. farm-to-school programs), and 12 states have passed measures to help inner-city residents gain better access to healthy foods.

Schwarte (2010) surveyed policymakers in California to gauge support for various state, local, and public school policies aimed at promoting healthy eating and physical activity. The respondents included members of the U.S. Senate and House, the California Assembly and Senate, county boards, city councils, and school boards. Mayors and school superintendents also responded. The authors found that 76% of the respondents considered personal responsibility to be the primary cause of obesity. It was concluded that framing the issue of obesity based on the ideology of the policymaker increased the odds of garnering support for obesity reduction policies. However, the conclusions of the study were limited by a low response rate (27%).
In terms of childhood obesity, Boehmer, Luke, Haire-Joshu, Bates, and Brownson (2008) scanned all 50 state legislatures to gather information on all childhood obesity prevention bills that had been introduced between 2002 and 2005. They found 717 bills upon which they conducted logistic regression analyses to determine both bill-level and state-level predictors of bill enactment. Out of the 717 bills introduced, only 17% were enacted (122 bills). Bills that had more than one sponsor, bipartisan sponsorship, an attached budget proposal, or were introduced in the state senate were more likely to pass. Bills that contained content areas related to walking/biking trails, safe routes to school, model school policies, statewide initiatives, and studies were also more likely to pass. State-level factors that increased the likelihood of the bill passing were Democratic control of both legislative chambers and a two year legislative session. The researchers concluded that bill-level factors were more influential than state-level factors in terms of bill enactment.

The study by Boehmer et al. provides public health advocacy groups and policymakers with information regarding which bill characteristics to focus on to improve bill enactment. The personal characteristics of state legislators themselves (i.e. political party affiliation, gender, BMI level, attitudes toward obesity, etc.) may also be important factors to include in any statistical model that attempts to predict the likelihood of obesity reduction measure enactment. Knowing which legislator characteristics predict support for obesity reduction measures can help public health advocates in much the same way as knowing which obesity prevention bill characteristics to target. There are no studies to date that examine the interplay between legislator characteristics and support for obesity reduction measures.
2.10 Summary

Obesity is a prevalent chronic condition in the U.S. that carries with it a host of detrimental health effects. The cause of obesity is a persistent failure to maintain energy balance. However, the main drivers of obesity come from all levels of ecological influence, especially the obesogenic environment that exists in the U.S. Changes to the environment can be made through policy-level approaches provided there is sufficient political support for such measures. Policy has a long and successful history in furthering the public’s health, but some view governmental intervention into private matters skeptically. The battle against Big Tobacco provides insight into the actions “Big Food” may take to promulgate its financial agenda and informs policy approaches for obesity reduction that counteract free-market failures. There are many individual-level strategies that can be adopted in order to lose weight, but given the obesogenic environment, such approaches are largely fallible. Several policy measures have been recommended by the CDC to combat population obesity. States have broad authority to enact such legislation and have passed a variety of obesity reduction measures to date.
Chapter 3

Methods

This chapter describes the methods that were utilized to conduct the present study. The chapter is broken into seven sections: Participant Selection, Instrument Development, Dependent and Independent Variables, Instrument Psychometrics, Data Collection, Data Analysis, and Summary. The methods described within this chapter were approved by the University of Toledo Human Subjects Institutional Review Board (Appendix A-Human Subjects Approval Letter).

3.1 Participant Selection

The sample of state legislators for this study was selected from the membership database of all 7,328 state legislators in the 50 states. This list is updated daily by the National Conference of State Legislatures (NCSL) which is “a bipartisan organization that serves the legislators and staffs of the nation's 50 states, its commonwealths and territories.” (National Conference of State Legislatures, 2009). Legislators from the U.S. commonwealths and territories (American Samoa, Guam, Northern Marianas Islands,
Puerto Rico, and the Virgin Islands) along with city council members in Washington, D.C. were excluded from selection.

An *a priori* power analysis was conducted using free, online statistical software developed by the Raosoft corporation (Raosoft, 2004). This analysis yielded a suggested sample size of 366 based on a 5% margin of error, a 95% confidence level, a population size of 7,382, and a 50/50 response distribution. These are all conservative values which helped to ensure appropriate power for generalizing results (Price, Dake, Murnan, Dimmig, & Akpanudo, 2005). A review of 73 articles that surveyed state legislators by Maestas, Neeley, and Richardson (2003) found response rates ranging from 44% to 47% for mailed surveys. A conservative value of 46% was used as an expected response rate in the present study. In order to reach power, 800 surveys were mailed out (800 x .46 = 368).

The 800 legislators who received surveys were selected randomly from the NCSL database after stratifying by all 50 states. States differ in the number of legislators that hold office because of diverse electoral parameters established by the various state constitutions. Furthermore, state population size does not correspond to number of legislators seated. For example, New Hampshire has 424 state legislator seats (400 House of Representatives and 24 Senate) while California has 120 seats (80 House and 42 Senate). An equal number (*n* = 16) of legislators were selected per state to account for the variance in number of legislators by state.

Additional steps were taken to ensure that the randomly selected sample of 800 legislators was truly representative of the total population of state legislators. The final sample was compared to the population of state legislators on key variables. Chi square
tests revealed no significant difference between the sample that received the instrument and the population of state legislators on sex ($\chi^2 = 0.275$, df = 1, $p = 0.60$), political party affiliation ($\chi^2 = 1.712$, df = 2, $p = 0.43$), and chamber designation ($\chi^2 = 0.28$, df = 1, $p = 0.60$).

3.2 Instrument Development

The Centers for Disease Control and Prevention’s (CDC) report *Recommended Community Strategies and Measurements to Prevent Obesity in the United States: Implementation and Measurement Guide* (2009h) was analyzed to glean potential obesity reduction policy measures. The report contained 24 policy recommendations broken into the following six categories:

1. Strategies to promote the availability of affordable healthy foods and beverages
2. Strategies to support healthy food and beverage choices
3. Strategy to encourage breastfeeding
4. Strategies to encourage physical activity or limit sedentary activity among children and youth.
5. Strategies to create safe communities that support physical activity
6. Strategy to encourage communities to organize for change

Strategies to encourage breastfeeding, zone for mix-use development, improve availability of mechanisms for purchasing foods from farms, and to encourage communities to organize for change were excluded from the instrument as potential obesity reduction measures because they were deemed to be conceptually dissonant with the remaining strategies. Eleven of the remaining strategies were then collapsed (four
pairs collapsed into four strategies and a trichotomy collapsed into one strategy) because they were considered duplicative as stand-alone strategies. This yielded 10 total items gleaned from the CDC report. Three taxation-related items (foods of limited nutritional value, regular soda, and fast food) were added as potential obesity reduction measures. Upon suggestion from the expert reviewers, restaurant menu labeling, food retailer labeling, prohibiting toys in unhealthy children’s meals, and mandating yearly K-12 physical education were also added as strategies. This yielded a total 17 obesity reduction measures that were included on the final instrument.

The survey was conceived of using the theoretical constructs perceived benefits, perceived barriers, and perceived severity of the Health Belief Model (Janz, Champion, & Strecher, 2002; Rosenstock, 1966), self-efficacy from the Social Cognitive Theory (Bandura, 1986), and behavioral intentions from the Theory of Planned Behavior (Ajzen, 1991). Item 1 asked for identification of the respondent as either a state legislator or a legislative aid. Following this item is a notice to any legislative aid who may be responding to provide answers on behalf of the legislator. Item 2 related to the perceived severity of obesity in the state. Items 3-7 gauged legislator perceptions and self-efficacy surrounding the causes of obesity, constituent concern, and the proper role of government in the debate. These items were taken from a previously validated instrument developed by Field Research Corporation and Samuels & Associates with funding from The California Endowment. This instrument was used to survey policymakers in California to gauge support for various state, local, and public school policies aimed at promoting healthy eating and physical activity. Items 8-24 presented the 17 potential obesity reduction measures and asked the respondent to rate their likelihood of voting on each
measure (behavioral intention) on a three point, bipolar response scale from “likely” to “unlikely”. In items 8-24, respondents were also asked to rate how impactful each measure could be on their state’s obesity level if enacted (i.e. outcome expectations) on a three point, unipolar response scale from “major impact” to “no impact”. Item 25 asked about the legislator’s perception of constituent support for the obesity reduction measures presented in items 8-24. Item 26 asked about the potential benefits to passing only the obesity reduction measures they supported in items 8-24. Six potential benefits were identified from the literature as the most common potential positive outcomes from voting for obesity reduction laws. Those benefits were reduced obesity levels, reduced state Medicaid expenditures, reduced absenteeism, improved health, improved quality of life, and improved employee productivity. Respondents were also given space to identify any benefits not already presented. Item 27 asked respondents to identify the potential barriers to supporting the obesity reduction measures which they did not support in items 8-24. The five most common potential barriers to voting for obesity reduction measures identified from the literature were difficulty of implementation, constituent opposition, personal beliefs, monetary costs to constituents, and special interest opposition. Respondents could also select “I supported all the measures” and “Not the role of government” as response choices. Item 27 was followed by 7 demographic questions. The final instrument utilized in the present study was a four page, 34 item survey printed on light green paper in booklet format (Appendix B).
3.3 Dependent and Independent Variables

The independent variables in the study were legislator age, gender, race, party affiliation, geographic location, level of education, obesity-related medical condition status, BMI category, perception of obesity as a serious societal problem (very serious, somewhat serious, not very serious, not serious at all), personal beliefs on the proper focus of obesity reduction efforts (personal factors, environmental factors, both equally), beliefs on constituents’ concerns for obesity-related issues, preferred role of government involvement in obesity reduction efforts, and perception of voter’s support for obesity reduction measures.

The dependent variables in the study were support for obesity reduction measures, perceived impact of obesity reduction measures, number of perceived benefits to passing obesity reduction measures, and number of perceived barriers to passing obesity reduction measures. The “support for obesity reduction measures” subscale were calculated by assigning a 2, 1, or 0 to each of the response choices (“likely”, “possibly”, and “unlikely”, respectively) for instrument items 8-24. Each legislator received a subscale “support” score and “impact” score for each type of obesity reduction measure (support for and impact of public school, community-based, and taxation-related measures). The “support for public school measures” subscale scores had a potential range of 0 to 12. The “support for community-based measures” subscale scores had a potential range of 0 to 16. The “support for taxation-related measures” subscale scores had a potential range of 0 to 6. The “perceived impact of obesity reduction measures” subscale scores ranged similarly with 0-12 for impact of public school measures, 0-16 for impact of community-based measures, and 0-6 for impact of taxation-related measures.
3.4 Instrument Psychometrics

3.4.1 Validity

Face validity of the survey was established through a comprehensive review of the literature on obesity, policy, and state legislators. Content validity of the instrument was established via an expert review panel consisting of 6 professionals in the fields of health education, public health, survey research, and policy (Appendix C). An email invitation with a copy of the survey instrument attached was sent to each expert along with instructions to review the instrument and provide suggestions for any modifications. Out of the six experts selected to review the instrument, five provided suggestions for changes. These suggestions were incorporated into the final instrument.

Factor analytic techniques were also used to explore the instrument’s construct validity on the support subscale (survey items 8a-24a). The final data were assessed using Bartlett’s test of sphericity to ensure that factor analysis was appropriate. Bartlett’s test of sphericity was significant and the Kaiser-Meyer-Olkin Measure was .923. Exploratory principal components analysis (PCA) using Varimax rotation was conducted on the final data to determine construct validity of the components (subscales) of the instrument. Item loadings of less than 0.40 were excluded from loading on the factors. Prior to conducting the PCA it was postulated that the 17 potential obesity reduction measures could be subjectively broken into five factors labeled “public school measures”, “community-based measures”, “private sector measures”, “labeling measures”, and “taxation-related measures”. A different factor model emerged upon completion of PCA. Using Catell’s scree test (Catell, 1966), a total of three factors were identified and retained (i.e. there was a distinct elbow evident between factors 3 and 4 on the scree
plot). The items comprising the three retained factors were subsequently interpreted and logically fit into three categories labeled “public school measures”, “community-based measures”, and “taxation-related measures”. These three factors accounted for 67.5% of the item variance. Four of the 17 items (survey items 10a, 17a, 19a, and 21a) loaded on more than one factor. In three of these instances, the stronger factor loading value was retained for analysis of responses. Table 3.1 depicts the retained factor loadings.

Table 3.1: Principal Components Analysis of the Support Subscale

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (Community Measures)</th>
<th>Factor 2 (Taxation Measures)</th>
<th>Factor 3 (School Measures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8a. Increasing healthy foods/beverages in public schools</td>
<td></td>
<td>.804</td>
<td></td>
</tr>
<tr>
<td>9a. Decreasing unhealthy foods/beverages in public schools</td>
<td></td>
<td>.813</td>
<td></td>
</tr>
<tr>
<td>10a. Making healthier foods/beverages in pub schools more affordable*</td>
<td>.483</td>
<td>.662</td>
<td></td>
</tr>
<tr>
<td>11a. Prohibiting unhealthy vending machine foods in pub schools</td>
<td></td>
<td>.776</td>
<td></td>
</tr>
<tr>
<td>12a. Smaller portion sizes in pub school lunches</td>
<td></td>
<td>.431</td>
<td></td>
</tr>
<tr>
<td>13a. Requiring yearly K-12 phys ed in pub schools</td>
<td></td>
<td>.524</td>
<td></td>
</tr>
<tr>
<td>14a. Tax incentives to grocers to locate in low-income areas</td>
<td>.786</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15a. Incentives to existing retailers in low-income areas to offer healthier foods/beverages</td>
<td>.740</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16a. Enhancing infrastructure to improve personal safety in areas where people are or could be active</td>
<td>.698</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17a. Enhancing infrastructure to support bicycling/walking for commuting/recreation*</td>
<td>.659</td>
<td>.410</td>
<td></td>
</tr>
<tr>
<td>18a. Encouraging private sector advertising of healthier foods/beverages</td>
<td>.753</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19a. Prohibiting toys in unhealthy fast food kids meals*</td>
<td>.411</td>
<td>.551</td>
<td></td>
</tr>
<tr>
<td>20a. Requiring restaurants to list calorie content of food items on menus</td>
<td>.534</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21a. Requiring food retailers to delineate healthier food items via a labeling system*</td>
<td>.562</td>
<td>.491</td>
<td></td>
</tr>
<tr>
<td>22a. Imposing a nominal fee on sugared beverages</td>
<td></td>
<td>.855</td>
<td></td>
</tr>
<tr>
<td>23a. Imposing a nominal fee on unhealthy fast food items</td>
<td></td>
<td>.893</td>
<td></td>
</tr>
<tr>
<td>24a. Imposing a nominal fee on Foods of Limited Nutritional Value</td>
<td></td>
<td>.899</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations. *Item loaded on more than one factor
Principal components analysis was also conducted on the *impact* subscale data for the 17 potential obesity reduction measures (survey items 8b-24b). Varimax rotation was employed and item loadings of less than 0.40 were excluded from loading on the factors. Bartlett’s test of sphericity was significant and the Kaiser-Meyer-Olkin Measure was .922. The instrument items correlated for the *impact* subscale (i.e. the items “hung together”) in a similar fashion to the *support* subscale. Three factors were retained for the *impact* subscale and, like the *support* subscale, were labeled “public school measures”, “community-based measures”, and “taxation-related measures”. These three factors accounted for 67.5% of the item variance. Four of the 17 *impact* subscale items loaded on more than one factor while two additional items loaded on factors in a dissimilar fashion when compared to the *support* subscale. Table 3.2 depicts the factor loadings for the *impact* subscale.

### 3.4.2 Reliability

Stability (test-retest) reliability was established through a small ($n = 10$) pilot test of state legislators and legislative aides from Ohio and Michigan. The legislators chosen for this reliability exercise were excluded from participating in the main study. A copy of the instrument along with a cover letter (Appendix D) explaining the purpose of the study and instructions to expect another survey in two weeks were emailed to each tester. A second copy of the instrument was sent two weeks later. Legislators returned completed questionnaires via email or fax. Data from the mailings were analyzed to determine stability reliability. Pearson product moment correlation coefficients were employed to evaluate stability reliability of continuous items for each of the support and impact subscales. Internal consistency reliability was also conducted on the final data collected.
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 (Community Measures)</th>
<th>Factor 2 (Taxation Measures)</th>
<th>Factor 3 (School Measures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8b. Increasing healthy foods/beverages in public schools</td>
<td></td>
<td>.809</td>
<td></td>
</tr>
<tr>
<td>9b. Decreasing unhealthy foods/beverages in public schools</td>
<td></td>
<td>.818</td>
<td></td>
</tr>
<tr>
<td>10b. Making healthier foods/beverages in pub schools more affordable</td>
<td></td>
<td>.755</td>
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</tr>
<tr>
<td>11b. Prohibiting unhealthy vending machine foods in pub schools</td>
<td></td>
<td>.768</td>
<td></td>
</tr>
<tr>
<td>12. Smaller portion sizes in pub school lunches*</td>
<td>.413</td>
<td>.652</td>
<td></td>
</tr>
<tr>
<td>13b. Requiring yearly K-12 phys ed in pub schools**</td>
<td>.658</td>
<td>.330*</td>
<td></td>
</tr>
<tr>
<td>14b. Tax incentives to grocers to locate in low-income areas*</td>
<td>.457</td>
<td>.408</td>
<td></td>
</tr>
<tr>
<td>15b. Incentives to existing retailers in low-income areas to offer healthier foods/beverages</td>
<td>.540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16b. Enhancing infrastructure to improve personal safety in areas where people are or could be active</td>
<td>.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17b. Enhancing infrastructure to support bicycling/walking for commuting/recreation</td>
<td>.803</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18b. Encouraging private sector advertising of healthier foods/beverages*</td>
<td>.440</td>
<td>.490</td>
<td></td>
</tr>
<tr>
<td>19b. Prohibiting toys in unhealthy fast food kids meals**</td>
<td>.363*</td>
<td>.518</td>
<td></td>
</tr>
<tr>
<td>20b. Requiring restaurants to list calorie content of food items on menus</td>
<td>.446</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21b. Requiring food retailers to delineate healthier food items via a labeling system*</td>
<td>.502</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22b. Imposing a nominal fee on sugared beverages</td>
<td></td>
<td>.823</td>
<td></td>
</tr>
<tr>
<td>23b. Imposing a nominal fee on unhealthy fast food items</td>
<td></td>
<td>.896</td>
<td></td>
</tr>
<tr>
<td>24b. Imposing a nominal fee on Foods of Limited Nutritional Value</td>
<td></td>
<td>.870</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

*a* Item loadings less than .40 retained to demonstrate conformity

*Item loaded on more than one factor

**Item loaded on a dissimilar factor when compared to the support subscale

in the main study. A coefficient alpha statistic was computed for continuous survey items on each of the support and impact subscales.

Pearson correlations showed strong, positive relationships from time 1 to time 2 for all of the support and impact subscales. Perceived benefits also showed a strong, positive relationship. The weakest relationship was found for perceived barriers although
an $r$ of .63 is still acceptable and was significant at the $p < .05$ level. Internal consistency was very good for the three support subscales and three impact subscales with coefficient alphas ranging from .94 to .86. Table 3.3 shows the test-retest reliability and internal consistency results.

Table 3.3: Reliability Analysis of Survey Instrument

<table>
<thead>
<tr>
<th>Subscale (number of items)</th>
<th>Stability $(n = 10)$</th>
<th>Internal Consistency $(n = 250)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for public school measures (6)</td>
<td>.97**</td>
<td>.86</td>
</tr>
<tr>
<td>Support for community-based measures (8)</td>
<td>.98**</td>
<td>.91</td>
</tr>
<tr>
<td>Support for taxation-related measures (3)</td>
<td>.82**</td>
<td>.94</td>
</tr>
<tr>
<td>Impact of public school measures (6)</td>
<td>.94**</td>
<td>.90</td>
</tr>
<tr>
<td>Impact of community-based measures (8)</td>
<td>.92**</td>
<td>.89</td>
</tr>
<tr>
<td>Impact of taxation-related measures (3)</td>
<td>.98**</td>
<td>.93</td>
</tr>
<tr>
<td>Perceived benefits (7)</td>
<td>.98**</td>
<td>.79*</td>
</tr>
<tr>
<td>Perceived barriers (7)</td>
<td>.63*</td>
<td>.50*</td>
</tr>
</tbody>
</table>

Note: $r =$ Pearson product moment correlation coefficient; $\alpha =$ Coefficient alpha
*KR-20
*p < .05, **p < .01

3.5 Data Collection

Approval from the University of Toledo Human Subjects Review Board (IRB) was obtained prior to data collection. An email notification (Appendix E) was sent to each legislator one week before the first wave mailing to alert the legislator of the survey to come. The survey instrument was mailed to participants in multiple waves to maximize return rate (King, Pealer, & Bernard, 2001). The first wave mailing included a personalized cover letter (Appendix F) hand signed by the primary investigator and
printed on University of Toledo letterhead, a copy of the survey instrument (printed in booklet format on light green paper) and a self-addressed, stamped return envelope. The return envelope was coded in order to discern respondents from non-respondents for the second wave mailing. It is customary in survey research to include a monetary incentive to increase the return rate (King et al., 2001). This strategy is not a legal option when public officials make up the sample population. In order to maximize the return rate, several statements ensuring strict confidentiality were written in the cover letter. The survey instrument itself was limited to four pages to curb respondents’ perceived cost of participating. Also, offering to send a copy of the results to the responding legislators has been used as a successful incentive strategy in past studies of state legislators (Maestas et al., 2003; Welsh, 1993). This strategy was employed in the present study as well to help maximize return rate.

A second wave mailing occurred approximately two weeks after the first wave. It was sent only to the homes of those state legislators in the sample who failed to respond to the first wave mailing. The second wave mailing included another cover letter (Appendix G), another copy of the survey instrument, and a self-addressed, stamped return envelope that was coded to distinguish respondents from non-respondents. A third wave mailing occurred approximately two weeks after the second wave and included a reminder letter (Appendix H), another copy of the survey instrument, and a self-addressed, stamped, coded return envelope. A fourth wave email (Appendix I) reminder with the survey attached was sent out approximately two weeks after the third wave with instructions to return the survey via fax or email attachment. Finally, in a fifth attempt to increase response rate, legislators ($n = 30$) from the lowest responding states were
contacted via telephone and asked to participate in the study (see Appendix J). Surveys were either faxed \((n = 5)\) or emailed \((n = 25)\) to those who were successfully contacted.

3.6 Data Analysis

Variability in legislator support for obesity reduction measures, perceived benefits to passing obesity reduction measures, and perceived barriers to passing obesity reduction measures were statistically examined using the independent variables. Parametric tests (Independent \(t\)-tests, ANOVA’s, and Pearson correlations) were employed to test hypotheses for normally distributed data. Non-parametric tests (Mann-Whitney \(U\), Kruskal-Wallis, and Spearman’s rho) were employed to test hypotheses when the data were non-normally distributed. Pearson skewness formulas \((\text{Skewness} = 3[\text{Mean} – \text{Median} / \text{SD}])\) were calculated to determine the degree to which data were skewed. The data was considered skewed if the Pearson skewness value fell outside the range of -0.5 to 0.5, (Pett, 1997). Table 3.4 depicts the research hypotheses, the instrument item that corresponds to each hypothesis, and the statistical test used. The NCSL database was used to capture various demographic characteristics of the legislators and is noted in the table as “NCSL database”.

Table 3.4. Data Analysis Rubric.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Instrument item</th>
<th>Statistical test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>NCSL database; #8a-13a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>1.2</td>
<td>Demographics #1; #8a-13a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>1.3</td>
<td>NCSL database; #8a-13a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>1.4</td>
<td>Demographics #5,6; #8a-13a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>1.5</td>
<td>NCSL database; #8a-13a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>1.6</td>
<td>#2; #8a-13a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>1.7</td>
<td>#5; #8a-13a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>1.8</td>
<td>#26; #8a-13a</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td>1.9</td>
<td>#27; #8a-13a</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td>2.1</td>
<td>NCSL database; #14a-21a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>2.2</td>
<td>Demographics #1; #14a-21a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>2.3</td>
<td>NCSL database; #14a-21a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>2.4</td>
<td>Demographics #5,6; #14a-21a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>2.5</td>
<td>NCSL database; #14a-21a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>2.6</td>
<td>#2; #14a-21a</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>2.7</td>
<td>#5; #14a-21a</td>
<td>ANOVA</td>
</tr>
<tr>
<td>2.8</td>
<td>#26; #14a-21a</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td>2.9</td>
<td>#27; #14a-21a</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td>3.1</td>
<td>NCSL database; #22a-24a</td>
<td>Mann-Whitney U Test</td>
</tr>
<tr>
<td>3.2</td>
<td>Demographics #1; #22a-24a</td>
<td>Mann-Whitney U Test</td>
</tr>
<tr>
<td>3.3</td>
<td>NCSL database; #22a-24a</td>
<td>Kruskal-Wallis</td>
</tr>
<tr>
<td>3.4</td>
<td>Demographics #5,6; #22a-24a</td>
<td>Kruskal-Wallis</td>
</tr>
<tr>
<td>3.5</td>
<td>NCSL database; #22a-24a</td>
<td>Kruskal-Wallis</td>
</tr>
<tr>
<td>3.6</td>
<td>#2; #22a-24a</td>
<td>Mann-Whitney U Test</td>
</tr>
<tr>
<td>3.7</td>
<td>#5; #22a-24a</td>
<td>Kruskal-Wallis</td>
</tr>
<tr>
<td>3.8</td>
<td>#26; #22a-24a</td>
<td>Spearman’s rho</td>
</tr>
<tr>
<td>3.9</td>
<td>#27; #22a-24a</td>
<td>Spearman’s rho</td>
</tr>
<tr>
<td>4.1</td>
<td>NCSL database; #26</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>4.2</td>
<td>Demographics #1; #26</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>4.3</td>
<td>NCSL database; #26</td>
<td>ANOVA</td>
</tr>
<tr>
<td>4.4</td>
<td>Demographics #5,6; #26</td>
<td>ANOVA</td>
</tr>
<tr>
<td>4.5</td>
<td>NCSL database; #26</td>
<td>ANOVA</td>
</tr>
<tr>
<td>4.6</td>
<td>#2; #26</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>4.7</td>
<td>#5; #26</td>
<td>ANOVA</td>
</tr>
<tr>
<td>5.1</td>
<td>NCSL database; #27</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>5.2</td>
<td>Demographics #1; #27</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>5.3</td>
<td>NCSL database; #27</td>
<td>ANOVA</td>
</tr>
<tr>
<td>5.4</td>
<td>Demographics #5,6; #27</td>
<td>ANOVA</td>
</tr>
<tr>
<td>5.5</td>
<td>NCSL database; #27</td>
<td>ANOVA</td>
</tr>
<tr>
<td>5.6</td>
<td>#2; #27</td>
<td>Independent t-test</td>
</tr>
<tr>
<td>5.7</td>
<td>#5; #27</td>
<td>ANOVA</td>
</tr>
<tr>
<td>6.1</td>
<td>NCSL database; Demographics #1, 2, 5, 6; #2, #3, #5; #8a-13a</td>
<td>Linear regression</td>
</tr>
<tr>
<td>7.1</td>
<td>NCSL database; Demographics #1, 2, 5, 6; #2, #3, #5; #14a-21a</td>
<td>Linear regression</td>
</tr>
<tr>
<td>8.1</td>
<td>NCSL database; Demographics #1, 2, 5, 6; #2, #3, #5; #22a-24a</td>
<td>Linear regression</td>
</tr>
</tbody>
</table>
3.7 Summary

This chapter described the methods that were utilized to conduct the present study, including participant selection, instrument development, instrument psychometrics, data collection, and data analysis. A representative sample was drawn randomly from a regularly updated database of state legislators. The sample completed a theoretically grounded, 34 item instrument. Data were collected using a three-wave mailing technique and subsequently analyzed using the Pearson correlation, independent \( t \)-tests, ANOVA, Kruskal-Wallis, Mann-Whitney U Tests, and linear regression functions associated with SPSS 17.0.
Chapter 4

Results

This chapter describes the findings of the current study. The Statistical Package for the Social Sciences (SPSS) version 17.0 was used to analyze the data. The chapter contains the following sections: Return Rate, Analysis of Non-respondents, Data Manipulation, Characteristics of Respondents (including demographic and political traits), Descriptions of the Support and Impact Subscale Results, Analysis of the Perceived Benefits/Barriers, Linear Regression Modeling, and Hypotheses Tests, and Summary.

4.1 Response Rate

Surveys were sent via regular U.S. mail to 800 state legislators. A total of 250 completed surveys were returned. The number of non-deliverable surveys \((n = 12)\) along with legislators who reported a blanket policy of non-participation in surveys \((n = 6)\) and legislators who retired during the study \((n = 1)\) were subtracted from the denominator before calculating the return rate. This procedure yielded an adjusted response rate of 32% represented arithmetically as \(\frac{250}{800 - [12 + 6 + 1]} = 32\%\). The response rates
for Republicans \((n = 118\text{ of } 420)\) and Democrats \((n = 121\text{ of } 356)\) were 28% and 34%, respectively. Legislators in the “other” political affiliation category \((n = 24)\) responded at a 46% rate.

A post-hoc power analysis was conducted using the final responses to the questionnaire to determine if the sample size obtained \((n = 250)\) with a response distribution of 36% vs. 64% was sufficient to reach power for generalizability. The percentage of responses for “unlikely” to support public school measures, “unlikely” to support community-based measures, and “unlikely” to support taxation-related measures were added together (616%) and then divided by the number of items \((n = 17)\) to arrive at an average percentage for “unlikely” to support responses (36%). Using a 36/64 distribution lowered the necessary sample size for generalizability to 338. Employing a 95% confidence level and the recommended sample size of 338 yielded a minimal increase in margin of error. Given the number of returned questionnaires \((n = 250)\) the sample obtained is adequate for generalizing to the population of state legislators with a margin of error of 5.85%.

4.2 Analysis of Non-Respondents

The legislators who responded were compared to the non-respondents on key demographic variables to determine if the two groups differed in any meaningful way. Chi square tests revealed no significant difference between the legislators who responded to the instrument and the non-responding state legislators on sex \((\chi^2 = 0.004, \text{df} = 1, p = 0.95)\), political party affiliation \((\chi^2 = 4.601, \text{df} = 2, p = 0.10)\), and chamber designation \((\chi^2 = 0.054, \text{df} = 1, p = 0.82)\).
4.3 Data Manipulation

Various independent variables were collapsed into fewer categories prior to conducting the statistical analyses to eliminate variable levels with very few cases. The race variable was dichotomized from its original five categories (white, black, Hispanic, Asian, and other) into “white” and “other”. Education was reduced from its original 10 levels to four: “less than Bachelor’s” (which included H.S. diploma, some college, and Associates), “Bachelor’s”, “Masters”, and “Doctorate” (PhD, JD, MD). The GED level was dropped because no one selected that option. The “other” category was dropped because it contained very few cases ($n = 10$) and an “other” degree includes several possible disciplines such as cosmetology, technical, etc. The BMI variable was collapsed from six levels (underweight, normal, overweight, class I obesity, class II obesity, and class III obesity) into three levels: “normal” (underweight + normal), “overweight”, and “obese” (class I, II, and III obesity). Governmental involvement in obesity reduction efforts was collapsed into a triad of “always/often”, “sometimes”, and “seldom/never”. Collapsing the variables race, education, governmental involvement in obesity reduction efforts, and BMI category into fewer levels helped to ensure that there were adequate cases for each level for appropriate statistical analyses.

As was noted in Chapter 3, legislators were asked to rate their level of support for and perceived impact of 17 hypothetical obesity reduction measures. For ease of interpretation and organization, overall support for and impact of the hypothetical obesity reduction measures are described in this chapter according to the three subscales public school measures, community-based measures, and taxation-related measures.
The more stringent p-value of .01 was utilized for hypothesis testing to reduce the type I error rate. In the tables, however, positive results at the \( p < .05 \) are reported to highlight conditions that were statistically significant at a less stringent level and to provide insights regarding potential type II errors.

## 4.4 Characteristics of Respondents

### 4.4.1 Demographic characteristics

Descriptive statistics were computed to describe the state legislators who responded to the survey (Table 4.1). The respondents were predominantly white (79%) males (78%) and over one-third (37%) of the respondents had completed a Bachelor’s degree. A plurality (43%) of the respondents had attained a graduate degree of some kind. The legislators that responded were fairly evenly distributed in geographic location (West, South, Midwest, Northeast). A little over one-third of the legislators (35%) were in the normal category for BMI range. About one-fifth (22%) of the respondents were in the obese category and close to half (43%) were overweight. Combining these two categories resulted in almost two-thirds (65%) of responding legislators self-reporting overweight or obesity. Furthermore, almost one-third (30%) of the respondents reported either personally having or a family member having an obesity-related medical condition.

### 4.4.2 Political characteristics

Respondents were fairly evenly split between Democrats \( n = 122 \) and Republicans \( n = 118 \) with the actual legislator (as opposed to an aide) responding to the questionnaire.
Table 4.1: Demographic Characteristics of Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>194</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>56</td>
<td>22</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>195</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Education</td>
<td>H.S. Diploma</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Some College</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Associate’s</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s</td>
<td>92</td>
<td>37</td>
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<tr>
<td></td>
<td>Masters</td>
<td>61</td>
<td>25</td>
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<tr>
<td></td>
<td>PhD</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>JD</td>
<td>40</td>
<td>16</td>
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<tr>
<td></td>
<td>MD</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Geographic Region</td>
<td>West</td>
<td>70</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>70</td>
<td>28</td>
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<tr>
<td></td>
<td>Midwest</td>
<td>63</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Northeast</td>
<td>47</td>
<td>19</td>
</tr>
<tr>
<td>BMI Category</td>
<td>Underweight</td>
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<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>79</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>99</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Class I Obesity</td>
<td>35</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Class II Obesity</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Class III Obesity</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Family Member with an Obesity-related Medical Condition

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>151</td>
<td>62</td>
</tr>
<tr>
<td>Yes</td>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>Unsure</td>
<td>18</td>
<td>8</td>
</tr>
</tbody>
</table>

*N = 250

*Note:* Percentages may not equal 100% due to rounding and/or non-reported answers.
more than eight out of ten times (83%). There were few respondents \( n = 11 \) categorized as “other” in terms of political affiliation. The “other” category included Democratic Farmer Labor Party, Progressive Party, Libertarian, and Independent. Respondents were more likely to be a member of a House of Representatives (71%) than a member of a Senate (29%). This was expected because there were more House members \( n = 5,464 \) or 75%) than Senate members \( n = 1,918 \) or 25%) in the total population of state legislators. Respondents ranged widely in their support for governmental intervention with 29% \( n = 72 \) preferring government to be involved with legislating obesity prevention efforts “always/often”, 30% \( n = 75 \) preferring government involvement “sometimes”, and 41% \( n = 102 \) preferring government involvement “seldom/never”. Respondents did not range widely in their recognition of obesity as a serious societal problem as over half (54%; \( n = 124 \) classified obesity as a “very serious” societal problem and 42% \( n = 95 \) classified obesity as a “somewhat serious” problem. Additionally, about one-third (32%) listed “state legislator” as their only occupation. Table 4.2 depicts the political characteristics of the legislators that responded.

4.5 Support Subscale

As was discussed in Chapter 3, data from principal components analysis indicated that three types of obesity reduction measures existed among the 17 hypothetical policies for the support subscale: “Public school measures” \( n = 6 \), “community-based measures” \( n = 8 \), and “taxation-related measures” \( n = 3 \). Table 4.3 lists the frequencies for each type of support response to the hypothetical obesity reduction measures in public schools.
Table 4.2: Political Characteristics of Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Role</td>
<td>Legislator</td>
<td>196</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Aide</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Political Affiliation</td>
<td>Democrat</td>
<td>121</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Republican</td>
<td>118</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Legislative Chamber</td>
<td>House</td>
<td>177</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Senate</td>
<td>73</td>
<td>29</td>
</tr>
<tr>
<td>Second Career</td>
<td>Dual Career</td>
<td>166</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Legislator Only</td>
<td>79</td>
<td>32</td>
</tr>
</tbody>
</table>

N = 250

Note: Percentages may not equal 100% due to rounding and/or non-reported answers.

Table 4.3: Legislator Support for Obesity Reduction Measures in Public Schools

<table>
<thead>
<tr>
<th>Item</th>
<th>Likely n (%)</th>
<th>Possibly n (%)</th>
<th>Unlikely n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing the availability of healthy foods/beverages in public schools</td>
<td>154 (62)</td>
<td>63 (25)</td>
<td>29 (12)</td>
</tr>
<tr>
<td>Requiring yearly K-12 physical education in public schools</td>
<td>154 (62)</td>
<td>69 (28)</td>
<td>21 (8)</td>
</tr>
<tr>
<td>Making healthy foods/beverages in public schools more affordable</td>
<td>130 (52)</td>
<td>69 (28)</td>
<td>46 (18)</td>
</tr>
<tr>
<td>Decreasing the availability of unhealthy foods/beverages in public schools</td>
<td>123 (49)</td>
<td>71 (28)</td>
<td>52 (21)</td>
</tr>
<tr>
<td>Prohibiting unhealthy vending machine foods in public schools</td>
<td>111 (44)</td>
<td>67 (27)</td>
<td>67 (27)</td>
</tr>
<tr>
<td>Instituting smaller portion sizes in public school lunches</td>
<td>36 (14)</td>
<td>105 (42)</td>
<td>102 (41)</td>
</tr>
</tbody>
</table>

N = 250

Note: Percentages may not add to 100% due to missing data/rounding.

A visual inspection of Table 4.3 suggests that the data for the support for public school measures subscale were negatively skewed. The Pearson skewness statistic was calculated and was found to be -0.39 indicating a negative skew. However, this value fell
within the range of -0.5 to 0.5 indicating not significantly skewed from a normal
distribution (Pett, 1997). Therefore, parametric tests were used for all hypotheses
associated with the variable “support for public school measures”.

Table 4.4 lists the frequencies for each type of support response to the
hypothetical obesity reduction measures in the community.

<table>
<thead>
<tr>
<th>Item</th>
<th>Likely n (%)</th>
<th>Possibly n (%)</th>
<th>Unlikely n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancing infrastructure to support bicycling/walking for commuting or recreation</td>
<td>126 (50)</td>
<td>81 (32)</td>
<td>35 (14)</td>
</tr>
<tr>
<td>Enhancing infrastructure to improve personal safety in areas where people are or could be active</td>
<td>91 (36)</td>
<td>110 (44)</td>
<td>40 (16)</td>
</tr>
<tr>
<td>Requiring restaurants to list calorie content of food items on menus</td>
<td>79 (32)</td>
<td>76 (30)</td>
<td>85 (34)</td>
</tr>
<tr>
<td>Providing tax incentives to grocers to locate in low-income areas</td>
<td>74 (30)</td>
<td>76 (30)</td>
<td>92 (37)</td>
</tr>
<tr>
<td>Providing incentives to existing retailers in low-income areas to offer healthier foods/beverages</td>
<td>67 (27)</td>
<td>81 (32)</td>
<td>94 (38)</td>
</tr>
<tr>
<td>Requiring food retailers to delineate healthier food items via a labeling system</td>
<td>49 (20)</td>
<td>83 (33)</td>
<td>111 (44)</td>
</tr>
<tr>
<td>Encouraging private sector advertising of healthier foods/beverages</td>
<td>46 (18)</td>
<td>77 (31)</td>
<td>119 (47)</td>
</tr>
<tr>
<td>Prohibiting toys in unhealthy fast food kids meals</td>
<td>27 (11)</td>
<td>50 (20)</td>
<td>163 (65)</td>
</tr>
</tbody>
</table>

N = 250

Note: Percentages may not add to 100% due to missing data/rounding.

A visual inspection of Table 4.4 suggests that the data for the support for community-based measures subscale were fairly evenly distributed. The Pearson skewness statistic was found to be 0.09 indicating non-significant skewness. Therefore, parametric tests were used for all hypotheses associated with the variable “support for community-based measures”. Table 4.5 lists the frequencies for each type of support response to the hypothetical taxation-related obesity reduction measures.
Table 4.5: Legislator Support for Taxation-Related Obesity Reduction Measures

<table>
<thead>
<tr>
<th>Item</th>
<th>Likely n (%)</th>
<th>Possibly n (%)</th>
<th>Unlikely n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imposing a nominal fee on sugared beverages</td>
<td>43 (17)</td>
<td>47 (19)</td>
<td>152 (61)</td>
</tr>
<tr>
<td>Imposing a nominal fee on unhealthy fast food items</td>
<td>29 (12)</td>
<td>51 (20)</td>
<td>163 (65)</td>
</tr>
<tr>
<td>Imposing a nominal fee on foods of limited nutritional value (candy,</td>
<td>27 (11)</td>
<td>51 (20)</td>
<td>165 (68)</td>
</tr>
<tr>
<td>gum, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 250

Note: Percentages may not add to 100% due to missing data/rounding.

A visual inspection of Table 4.5 suggests that the data for the support for taxation-related measures subscale were positively skewed. The Pearson skewness statistic was found to be 1.6 indicating a significant positive skewness. Therefore, non-parametric tests were used for all hypotheses associated with the variable “support for taxation-related measures”.

To calculate the legislator support subscale, point values were assigned to the available response options with “likely” worth 2 points, “possibly” worth 1 point, and “unlikely” worth zero points. For example, a legislator selecting the response option “likely” for all 6 public school measures would score 12 on the public school support subscale. A legislator responding “unlikely” for all 6 public school measures would score a 0 on the public school support subscale. The potential range of support for public school measures was therefore 0-12. The potential range of support for community-based measures was 0-16. The potential range for taxation-related measures was 0-6.

Table 4.6 depicts the means and standard deviations for demographics by support for public school and community-based measures. Medians are displayed for the taxation-related measures. Table 4.7 shows support for the three types of measures by key political characteristics.
Table 4.6: Support for Obesity Reduction Measures by Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>Public School Measures $M \ (SD)^1$</th>
<th>Community Measures $M \ (SD)^2$</th>
<th>Taxation Measures $Mdn^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>181</td>
<td>7.2 (3.4)$^A$</td>
<td>6.6 (4.7)$^A$</td>
<td>0$^A$</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>49</td>
<td>8.7 (3.4)$^A$</td>
<td>9.0 (4.7)$^A$</td>
<td>1$^A$</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>177</td>
<td>7.3 (3.3)$^A$</td>
<td>6.5 (4.5)$^A$</td>
<td>0$^a$</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>45</td>
<td>8.7 (3.5)$^A$</td>
<td>10.1 (4.8)$^A$</td>
<td>1.5$^a$</td>
</tr>
<tr>
<td>Education</td>
<td>&lt; Bachelor’s</td>
<td>34</td>
<td>6.7 (3.6)</td>
<td>5.3 (4.4)</td>
<td>0$^A$</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s</td>
<td>88</td>
<td>7.2 (3.4)</td>
<td>6.7 (4.7)</td>
<td>0$^{A b}$</td>
</tr>
<tr>
<td></td>
<td>Masters</td>
<td>52</td>
<td>8.0 (3.6)</td>
<td>8.2 (4.9)</td>
<td>1$^A$</td>
</tr>
<tr>
<td></td>
<td>Doctoral</td>
<td>42</td>
<td>8.2 (3.4)</td>
<td>8.0 (5.0)</td>
<td>1.5$^{A b}$</td>
</tr>
<tr>
<td>Geographic Region</td>
<td>West</td>
<td>67</td>
<td>7.1 (4.1)</td>
<td>7.0 (4.9)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>63</td>
<td>8.4 (2.7)</td>
<td>8.7 (4.6)$^B$</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Midwest</td>
<td>59</td>
<td>6.9 (3.5)</td>
<td>5.5 (4.4)$^B$</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Northeast</td>
<td>37</td>
<td>7.6 (3.4)</td>
<td>7.2 (4.7)</td>
<td>0</td>
</tr>
<tr>
<td>BMI Category</td>
<td>Normal</td>
<td>71</td>
<td>7.6 (3.3)</td>
<td>7.3 (4.3)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>91</td>
<td>7.1 (3.0)</td>
<td>6.6 (5.0)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Obese</td>
<td>47</td>
<td>8.2 (3.0)</td>
<td>8.0 (5.9)</td>
<td>0</td>
</tr>
</tbody>
</table>

$N = 250$

Note: Numbers may not add to 250 due to missing data.

1 Potential range = 0 – 12
2 Potential range = 0 – 16
3 Potential range = 0 – 6

Letters denote paired significant differences with lower-case letters = $p < .05$ and capitalized letters = $p < .01$

4.5.1 Support for public school measures

Overall, public school measures were the most highly supported of the three types of hypothetical obesity reduction policies (public schools, community-based, taxation-
Table 4.7: Support for Obesity Reduction Measures by Political Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>Public School Measures ($M, SD$)</th>
<th>Community Measures ($M, SD$)</th>
<th>Taxation Measures $Md$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$^1$</td>
<td>$^2$</td>
<td>$^3$</td>
</tr>
<tr>
<td>Political role:</td>
<td>Legislator</td>
<td>174</td>
<td>7.6 (3.6)$^a$</td>
<td>7.1 (4.8)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Aide</td>
<td>36</td>
<td>6.9 (2.9)$^a$</td>
<td>7.1 (4.4)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Affiliation:</td>
<td>Republican</td>
<td>113</td>
<td>5.6 (3.4)$^A$</td>
<td>4.2 (3.5)$^A$</td>
<td>0$^A$</td>
</tr>
<tr>
<td></td>
<td>Democrat</td>
<td>103</td>
<td>9.7 (2.1)$^{AB}$</td>
<td>10.6 (3.8)$^{AB}$</td>
<td>3$^A$</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10</td>
<td>5.8 (2.8)$^B$</td>
<td>4.9 (3.5)$^B$</td>
<td>1$^B$</td>
</tr>
<tr>
<td>Legislative Chamber:</td>
<td>House</td>
<td>156</td>
<td>7.4 (3.6)</td>
<td>7.0 (4.8)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Senate</td>
<td>70</td>
<td>7.6 (3.4)</td>
<td>7.3 (4.7)</td>
<td>0</td>
</tr>
<tr>
<td>Second Career</td>
<td>Dual career</td>
<td>152</td>
<td>7.2 (3.6)</td>
<td>6.9 (4.8)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Legislator only</td>
<td>70</td>
<td>8.0 (3.3)</td>
<td>7.4 (4.7)</td>
<td>0</td>
</tr>
</tbody>
</table>

$N = 250$

Note: Numbers may not add to 250 due to missing data.

$^1$Potential range = 0 – 12

$^2$Potential range = 0 – 16

$^3$Potential range = 0 – 6

Letters denote paired significant differences with lower-case letters = $p < .05$ and capitalized letters = $p < .01$

In terms of demographic characteristics, females ($M = 8.7, SD = 3.4$) were significantly more likely than males ($M = 7.2, SD = 3.4$) to be supportive of obesity reduction measures in public schools ($t = -2.713, df = 233, p = .007$). Respondents who categorized themselves as White ($M = 7.3, SD = 3.3$) were significantly less supportive ($t = -2.713, df = 233, p = .007$) of obesity reduction measures in public schools than respondents who were non-White ($M = 8.8, SD = 3.5$). Formal education was not statistically significantly different by support. However, visual inspection of the means suggests support for public school measures increases with an increase in formal
education from less than Bachelor’s ($M = 6.7$) to Doctorate ($M = 8.2$). Respondents did not differ significantly in their support for public school measures by BMI category or geographic location although average support showed a u-shaped curve with respect to BMI category with overweight ($M = 7.1$) legislators being less supportive than both normal weight ($M = 7.6$) and obese ($M = 8.2$) respondents.

In terms of political characteristics, ANOVA with Bonferroni post-hoc tests showed that Democrats ($M = 9.7$, $SD = 2.1$) were significantly more likely ($F = 61.433$, $df = 2$, $p < .001$) to support public school measures than both Republicans ($M = 5.6$, $SD = 3.4$) and respondents classified as “other” in terms of political affiliation ($M = 7.3$, $SD = 3.3$). Republicans and respondents classified as “other” in terms of political affiliation did not differ significantly from one another. Legislators who perceived obesity to be a “very serious” societal problem ($M = 9.0$, $SD = 2.7$) were significantly more likely ($t = 6.133$, $df = 213$, $p < .001$) to support obesity reduction measures in public schools than were legislators who perceived obesity to be a “somewhat” serious societal problem ($M = 6.3$, $SD = 3.6$). Legislators differed significantly in their support for public school measures by preferred level of government involvement in legislating obesity prevention efforts ($F = 90.827$, $df = 2$, $p < .001$). Legislators who felt government should “always/often” be involved ($M = 10.2$, $SD = 1.6$) were significantly more supportive of public school measures than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts ($M = 8.6$, $SD = 2.4$). Furthermore, legislators who preferred government to legislate obesity prevention efforts “seldom/never” ($M = 4.9$, $SD = 3.2$) were significantly less likely to be supportive than both legislators who preferred government to “sometimes” be involved ($p < .001$) and
legislators who preferred government to “always/often” be involved \((p < .001)\). Respondents did not differ significantly in their support for public school measures by legislative chamber, political role, or having a career outside politics.

In terms of number of perceived benefits and barriers, a significant and moderately strong, positive relationship between legislator support for obesity reduction measures in public schools and number of perceived benefits to passing such measures was found \((r = .60, p < .001)\). There was a statistically significant but weak, negative relationship between legislator support for obesity reduction measures in public schools and number of perceived barriers to passing such measures \((r = -.17, p = .01)\).

### 4.5.2 Support for community-based measures

Support for community-based obesity reduction measures displayed a similar pattern to public school measures. Females \((M = 9.0, SD = 4.8)\) were significantly more likely to support obesity reduction measures in the community than were males \((M = 6.6, SD = 4.7; t = -3.201, df = 229, p = .002)\). White legislators \((M = 6.5, SD = 4.5)\) were significantly less likely \((t = -4.785, df = 225, p < .001)\) to support obesity reduction measures in the community than were non-White legislators \((M = 10.1, SD = 4.8)\). Democrats \((M = 10.6, SD = 3.8)\) were significantly more likely to support community measures \((F = 90.297, df = 2, p < .001)\) than both Republicans \((M = 4.2, SD = 3.5)\) and respondents classified as “other” in terms of political affiliation \((M = 4.9, SD = 3.5)\). Republicans and respondents classified as “other” in terms of political affiliation did not differ significantly from one another. There were also no significant differences in support for community measures by legislative chamber, having a career outside politics,
BMI category, and education. However, as was the case with public school measures, visual inspection of the means showed support for community-based measures increased with an increase in formal education from less than Bachelor’s (M = 5.3) to Doctorate (M = 8.0) albeit at a non-significant level. Furthermore, average support for community-based measures followed a u-shaped curve with respect to BMI category with overweight (M = 6.6) legislators being less supportive than both normal weight (M = 7.3) and obese (M = 8.0) respondents.

Unlike public school measures which showed no significant differences by geography, legislators in the South (M = 8.7, SD = 4.6) were significantly more likely (F = 5.105, df = 3, p = .002) to support community-based measures than legislators in the Midwest (M = 5.5, SD = 4.4). Legislators in the West (M = 7.0, SD = 4.9) and Northeast (M = 7.2, SD = 4.7) did not significantly differ in their support from Midwestern or Southern legislators or from each other. Legislators who perceived obesity to be a “very serious” societal problem (M = 9.0, SD = 4.5) were significantly more likely (t = 6.109, df = 209, p < .001) to support community measures than were legislators who perceived obesity to be a “somewhat” serious societal problem (M = 5.3, SD = 4.2). Respondents who preferred government to be involved in legislating obesity prevention efforts “always/often” (M = 11.7, SD = 3.5) were significantly more supportive (F = 111.124, df = 2, p < .001) of obesity reduction measures in the community than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts (M = 8.0, SD = 3.7). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” (M = 3.6, SD = 3.1) were significantly less likely (p = <.001) to support community measures than both legislators who preferred government
to “sometimes” be involved and legislators who preferred government to “always/often” be involved ($p = <.001$).

Analyses of perceived benefits showed a significant and moderately strong, positive relationship between legislator support for obesity reduction measures in the community and number of perceived benefits to passing such measures ($r = .61$, $p < .001$). There was a statistically significant but weak, negative relationship between legislator support for obesity reduction measures in the community and number of perceived barriers to passing such measures ($r = -.27$, $p < .001$).

### 4.5.3 Support for taxation-related measures

Overall support for taxation-related measures was very low compared to public school and community-based measures. Females were significantly more supportive of taxation-related obesity reduction measures with a median ($Mdn$) of 1 compared to a median of 0 for males ($z = -3.377$, $p = .001$). There was no significant difference in support ($z = -2.412$, $p = .016$) among non-White legislators compared to White legislators ($Mdn = 1.5$ and 0, respectively). Support for taxation measures did vary by education. Kruskal-Wallis with Mann-Whitney $U$ post-hoc tests showed that less formal education lead to significantly lower support for taxation measures ($\chi^2(3, N = 227) = 15.642$, $p = .001$). Respondents with less than a Bachelor’s degree ($Mdn = 0$) were significantly less likely to support taxation measures than both those with Masters degrees ($Mdn = 1$) and Doctoral degrees ($Mdn = 1.5$). Respondents with less than a Bachelor’s degree did not differ significantly ($p = .025$) from those with a Bachelor’s level of education ($Mdn = 0$). While not statistically significant, mean ranks showed that
the Midwestern region ($M_{rank} = 111.9$) and Southern region ($M_{rank} = 118.10$) were less supportive of taxation-related measures than Western ($M_{rank} = 123.1$) and Northeastern regions ($M_{rank} = 130.0$) albeit a non-significant difference.

Democrats ($Mdn = 3$) and legislators with “other” political affiliations ($Mdn = 1$) were significantly more likely to support ($\chi^2(2, N = 239) = 74.722, p < .001$) taxation-related obesity reduction measures than Republicans ($Mdn = 0$). Democrats and respondents classified as “other” in terms of political affiliation did not differ significantly from one another. There were no significant differences found for BMI category, geographic region, or having a career outside politics. However, respondents who perceived obesity to be a “very serious” societal problem ($Mdn = 1$) were significantly more likely to support ($z = -4.611, p < .001$) taxation-related obesity reduction measures than were legislators who perceived obesity to be a “somewhat” serious societal problem ($Mdn = 0$). Additionally, legislators varied in their support for taxation measures by level of government involvement in such matters [$\chi^2(2, N = 239) = 79.972, p < .001$]. Follow-up Mann-Whitney $U$ tests showed legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” ($Mdn = 3$) were significantly more supportive ($z = 4.181, p < .001$) of taxation-related obesity reduction measures than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts ($Mdn = 0$). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” ($Mdn = 0$) were significantly less likely to be supportive of taxation-related measures than legislators who preferred government to “sometimes” be involved ($z = -5.203, p < .001$) and “always/often” be involved ($z = -8.887, p < .001$).
In terms of perceived benefits and barriers, there was a significant and moderately strong, positive relationship between legislator support for taxation-related obesity reduction measures and number of perceived benefits to passing such measures \((r = .35, p < .001)\). There was also a statistically significant and moderately strong, negative relationship between legislator support for taxation-related obesity reduction measures and number of perceived barriers to passing such measures \((r = -.40, p < .001)\).

### 4.6 Perceived Impact Subscale

As with the support subscale, data from principal components analysis indicated that three types of obesity reduction measures existed among the 17 hypothetical policies for the perceived impact subscale: “Public school measures” \((n = 6)\), “community-based measures” \((n = 8)\), and “taxation-related measures” \((n = 3)\). Table 4.8 lists the frequencies for each type of perceived impact response to the hypothetical obesity reduction measures in public schools.

<table>
<thead>
<tr>
<th>Item</th>
<th>Major Impact n (%)</th>
<th>Minor Impact n (%)</th>
<th>No Impact n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requiring yearly K-12 physical education in public schools</td>
<td>133 (53)</td>
<td>91 (36)</td>
<td>12 (5)</td>
</tr>
<tr>
<td>Decreasing the availability of unhealthy foods/beverages in public schools</td>
<td>84 (37)</td>
<td>125 (50)</td>
<td>22 (9)</td>
</tr>
<tr>
<td>Increasing the availability of healthy foods/beverages in public schools</td>
<td>79 (32)</td>
<td>133 (53)</td>
<td>22 (9)</td>
</tr>
<tr>
<td>Making healthier foods/beverages in public schools more affordable</td>
<td>73 (29)</td>
<td>129 (52)</td>
<td>31 (12)</td>
</tr>
<tr>
<td>Prohibiting unhealthy vending machine foods in public schools</td>
<td>67 (27)</td>
<td>128 (51)</td>
<td>39 (16)</td>
</tr>
<tr>
<td>Instituting smaller portion sizes in public school lunches</td>
<td>28 (11)</td>
<td>148 (59)</td>
<td>59 (24)</td>
</tr>
</tbody>
</table>

\(N = 250\)

_Note:_ Percentages may not add to 100% due to missing data/rounding. Numbers may not add to 250 due to missing data.
Visual inspection of table 4.8 indicates a fairly normal distribution of the data. The Pearson skewness statistic was 0.19 indicating very little skewness. Therefore, parametric tests were used for all hypotheses associated with the variable “perceived impact of public school measures”.

Table 4.9 lists the frequencies for each type of perceived impact response to the hypothetical obesity reduction measures in the community.

<table>
<thead>
<tr>
<th>Item</th>
<th>Major Impact n (%)</th>
<th>Minor Impact n (%)</th>
<th>No Impact n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancing infrastructure to support bicycling/walking for commuting or recreation</td>
<td>86 (34)</td>
<td>124 (50)</td>
<td>27 (11)</td>
</tr>
<tr>
<td>Enhancing infrastructure to improve personal safety in areas where people are or could be active</td>
<td>68 (27)</td>
<td>129 (52)</td>
<td>36 (14)</td>
</tr>
<tr>
<td>Providing incentives to existing retailers in low-income areas to offer healthier foods/beverages</td>
<td>48 (19)</td>
<td>111 (44)</td>
<td>74 (30)</td>
</tr>
<tr>
<td>Providing tax incentives to grocers to locate in low-income areas</td>
<td>46 (18)</td>
<td>105 (42)</td>
<td>82 (33)</td>
</tr>
<tr>
<td>Requiring restaurants to list calorie content of food items on menus</td>
<td>42 (17)</td>
<td>123 (49)</td>
<td>71 (28)</td>
</tr>
<tr>
<td>Encouraging private sector advertising of healthier foods/beverages</td>
<td>35 (14)</td>
<td>123 (49)</td>
<td>78 (31)</td>
</tr>
<tr>
<td>Requiring food retailers to delineate healthier food items via a labeling system</td>
<td>33 (13)</td>
<td>130 (52)</td>
<td>73 (29)</td>
</tr>
<tr>
<td>Prohibiting toys in unhealthy fast food kids meals</td>
<td>19 (8)</td>
<td>90 (36)</td>
<td>125 (50)</td>
</tr>
</tbody>
</table>

\(N = 250\)

*Note:* Percentages may not add to 100% due to missing data/rounding. Numbers may not add to 250 due to missing data.

Visual inspection of table 4.9 indicates a fairly normal distribution of the data. The Pearson skewness statistic was 0.04 indicating virtually no skewness. Therefore, parametric tests were used for all hypotheses associated with the variable “perceived impact of community-based measures”.
Table 4.10 lists the frequencies for each type of perceived impact response to the hypothetical taxation-related obesity reduction measures.

<table>
<thead>
<tr>
<th>Item</th>
<th>Major Impact</th>
<th>Minor Impact</th>
<th>No Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imposing a nominal fee on sugared beverages</td>
<td>29 (12)</td>
<td>112 (45)</td>
<td>94 (38)</td>
</tr>
<tr>
<td>Imposing a nominal fee on unhealthy fast food items</td>
<td>24 (10)</td>
<td>109 (44)</td>
<td>103 (41)</td>
</tr>
<tr>
<td>Imposing a nominal fee on foods of limited nutritional value (candy,</td>
<td>18 (7)</td>
<td>107 (43)</td>
<td>111 (44)</td>
</tr>
</tbody>
</table>
gum, etc.)                                                            |              |              |           |

N = 250

Note: Percentages may not add to 100% due to missing data/rounding. Numbers may not add to 250 due to missing data.

Visual inspection of table 4.10 indicates a potentially positively skewed distribution of the data. The Pearson skewness statistic was -0.03 indicating a diminutive negative skewness. Therefore, parametric tests were used for all hypotheses associated with the variable “perceived impact of community-based measures”.

To calculate the legislator perceived impact subscale, point values were assigned to the available response options with “major impact” worth 2 points, “minor impact” worth 1 point, and “no impact” worth zero points. For example, if a legislator chose “major impact” for all 8 community-based measures, they would score 16 on the community-based perceived impact subscale. A legislator responding “no impact” for all 6 public school measures would score a 0 on the public school impact subscale. The potential range of perceived impact for community-based measures was therefore 0-16. The potential range of support for public school measures was 0-12 while the potential range for taxation-related measures was 0-6. Table 4.11 depicts the means and standard deviations for demographics by perceived impact of public school and community-based
measures. Medians and standard deviations are displayed for the taxation-related measures.

### Table 4.11: Perceived Impact of Obesity Reduction Measures by Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>$n$</th>
<th>Public School Measures ($M, SD$)</th>
<th>Community Measures ($M, SD$)</th>
<th>Taxation Measures ($M, SD$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>($M, SD)^{1}$</td>
<td>($M, SD)^{2}$</td>
<td>($M, SD)^{3}$</td>
</tr>
<tr>
<td>Sex:</td>
<td>Male</td>
<td>176</td>
<td>6.8 (2.9)^A</td>
<td>6.6 (3.8)^A</td>
<td>1.8 (1.8)^a</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>50</td>
<td>8.3 (3.2)^A</td>
<td>8.6 (4.3)^A</td>
<td>2.5 (1.9)^a</td>
</tr>
<tr>
<td>Race:</td>
<td>White</td>
<td>177</td>
<td>6.7 (2.9)^A</td>
<td>6.5 (3.7)^A</td>
<td>1.9 (1.8)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>45</td>
<td>9.0 (3.0)^a</td>
<td>9.3 (4.4)^a</td>
<td>2.5 (2.0)</td>
</tr>
<tr>
<td>Education:</td>
<td>&lt; Bachelor's</td>
<td>35</td>
<td>6.0 (2.3)^a</td>
<td>5.1 (2.9)^A</td>
<td>1.1 (1.5)^A</td>
</tr>
<tr>
<td></td>
<td>Bachelor's</td>
<td>86</td>
<td>7.0 (3.4)</td>
<td>7.1 (4.4)</td>
<td>1.8 (1.9)</td>
</tr>
<tr>
<td></td>
<td>Masters</td>
<td>55</td>
<td>7.8 (3.0)^A</td>
<td>8.2 (3.9)^a</td>
<td>2.3 (1.7)^a</td>
</tr>
<tr>
<td></td>
<td>Doctoral</td>
<td>41</td>
<td>7.7 (2.9)</td>
<td>7.5 (3.8)</td>
<td>2.7 (1.8)^A</td>
</tr>
<tr>
<td>Geographic Region:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>66</td>
<td>7.0 (3.1)</td>
<td>7.6 (4.1)</td>
<td>2.2 (1.9)</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>62</td>
<td>8.2 (3.0)^B</td>
<td>8.2 (4.2)^B</td>
<td>2.0 (1.9)</td>
</tr>
<tr>
<td></td>
<td>Midwest</td>
<td>59</td>
<td>6.3 (2.7)^B</td>
<td>5.5 (3.7)^B</td>
<td>1.6 (1.7)</td>
</tr>
<tr>
<td></td>
<td>Northeast</td>
<td>39</td>
<td>6.8 (2.7)</td>
<td>6.8 (3.6)</td>
<td>2.2 (1.7)</td>
</tr>
<tr>
<td>BMI Category:</td>
<td>Normal</td>
<td>76</td>
<td>7.2 (3.3)</td>
<td>7.5 (3.8)</td>
<td>2.3 (1.9)</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>88</td>
<td>6.8 (2.9)</td>
<td>6.4 (4.1)</td>
<td>1.9 (1.7)</td>
</tr>
<tr>
<td></td>
<td>Obese</td>
<td>46</td>
<td>8.0 (2.4)</td>
<td>7.8 (4.0)</td>
<td>1.9 (1.7)</td>
</tr>
</tbody>
</table>

$N = 250$

*Note: Numbers may not add to 250 due to missing data.*

$^1$Potential range = 0 – 12

$^2$Potential range = 0 – 16

$^3$Potential range = 0 – 6

Letters denote paired significant differences with lower-case letters = $p < .05$ and capitalized letters = $p < .01$
Table 4.12 shows perceived impact of the three types of measures by key political characteristics.

Table 4.12: Perceived Impact of Obesity Reduction Measures by Political Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>Public School Measures ($M, SD$) $^1$</th>
<th>Community Measures ($M, SD$) $^2$</th>
<th>Taxation Measures ($M, SD$) $^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political role:</td>
<td>Legislator</td>
<td>175</td>
<td>7.2 (3.1)</td>
<td>7.2 (4.0)</td>
<td>2.0 (1.8)</td>
</tr>
<tr>
<td></td>
<td>Aide</td>
<td>38</td>
<td>7.0 (2.6)</td>
<td>6.3 (3.8)</td>
<td>1.7 (1.8)</td>
</tr>
<tr>
<td>Political Affiliation:</td>
<td>Republican</td>
<td>111</td>
<td>5.5 (2.6)$^A$</td>
<td>5.0 (3.2)$^A$</td>
<td>1.1 (1.5)$^A$</td>
</tr>
<tr>
<td></td>
<td>Democrat</td>
<td>105</td>
<td>8.9 (2.5)$^{AB}$</td>
<td>9.5 (3.5)$^A$</td>
<td>2.8 (1.7)$^A$</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10</td>
<td>6.5 (2.2)$^B$</td>
<td>5.0 (3.5)</td>
<td>2.1 (1.9)</td>
</tr>
<tr>
<td>Legislative Chamber:</td>
<td>House</td>
<td>160</td>
<td>6.9 (2.7)</td>
<td>7.3 (4.1)</td>
<td>1.9 (1.8)</td>
</tr>
<tr>
<td></td>
<td>Senate</td>
<td>66</td>
<td>7.6 (3.2)</td>
<td>7.0 (4.0)</td>
<td>2.1 (1.6)</td>
</tr>
<tr>
<td>Second Career</td>
<td>Dual career</td>
<td>152</td>
<td>6.9 (3.2)$^a$</td>
<td>6.9 (4.0)</td>
<td>1.9 (1.8)</td>
</tr>
<tr>
<td></td>
<td>Legislator only</td>
<td>70</td>
<td>7.7 (2.7)$^a$</td>
<td>7.4 (4.0)</td>
<td>2.1 (1.8)</td>
</tr>
</tbody>
</table>

$N = 250$

Note: Numbers may not add to 250 due to missing data.

$^1$Potential range = 0 – 12

$^2$Potential range = 0 – 16

$^3$Potential range = 0 – 6

Letters denote paired significant differences with lower-case letters = $p < .05$ and capitalized letters = $p < .01$

4.6.1 Perceived impact of public school measures

Respondents differed significantly in their perceptions of the impact public school measures might have on their state’s obesity level if enacted. Females perceived
significantly higher potential impact than males ($t = -3.039$, df = 224, $p = .003$) as did members of the “other” racial category when compared to White respondents ($t = -4.640$, df = 220, $p < .001$). As formal education increased, so did perception of impact with a significant difference between those with less than a Bachelor’s and those with a Masters degree ($F = 2.784$, df = 3, $p = .04$). Perceived potential impact of public school measures was significantly higher for those respondents living in the South compared to the Midwest region ($F = 4.290$, df = 3, $p = .006$). Impact did not vary by BMI category but it did significantly vary by political affiliation with Democrats perceiving more of a potential impact than both Republicans and “other” parties ($F = 45.270$, df = 2, $p < .001$).

4.6.2 Perceived impact of community-based measures

Perceived potential impact of community-based measures on state obesity levels followed much the same pattern as impact of public school measures. Females compared to males ($t = -3.169$, df = 221, $p = .002$), Democrats compared to Republicans ($F = 51.177$, df = 2, $p < .001$), and respondents from the South compared to the Midwest ($F = 5.131$, df = 3, $p = .002$) perceived greater potential impact. Likewise, members of the “other” racial category compared to the White category ($t = -4.581$, df = 217, $p < .001$) and those respondents with more formal education ($F = 4.455$, df = 3, $p = .005$) perceived greater potential impact for the community-based measures. Perceived impact did not vary by BMI category, political role, legislative chamber, or career status.

4.6.3 Perceived impact of taxation-related measures

Legislators perceived much less potential impact for the taxation-related measures
comparing to both public school and community-based measures. The differences reached statistically significant levels for females perceiving more impact compared to males \((t = -2.304, df = 230, p = .02)\) and the more formally educated (Masters and Doctorate) compared to those with less than a bachelor’s degree \((F = 5.781, df = 3, p = .001)\). Perceived impact of taxation-related measures was also greater for members of the Democratic party compared to Republicans \((F = 30.597, df = 2, p < .001)\). Perceived impact did not vary significantly by BMI category, geographic location, legislative chamber, political role, or having a career outside of politics.

### 4.7 Perceived Benefits and Perceived Barriers

Respondents were asked to identify the potential benefits that may arise from passage of only those obesity reduction measures they supported. For example, if a legislator was only supportive of the 6 public school measures and not the taxation-related measures, perceived benefits would be based upon implementation of only the public school measures. There were 7 perceived benefit response options: reduced obesity level, reduced state Medicaid expenditures, reduced absenteeism, improved health, improved quality of life, improved employee productivity, and other. The range for a perceived benefit score was 0-7. Four of the seven items were supported by over 50% of the legislators. The most often cited benefit of passing the obesity reduction measures was improved health, followed by improved quality of life, reduced obesity levels, and reduced state Medicaid expenditures. Table 4.13 ranks each of the benefits and barriers in order from most often selected to least often selected.
Table 4.13: Rank Order of Perceived Benefits

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improved health</td>
<td>192</td>
<td>78</td>
</tr>
<tr>
<td>2</td>
<td>Improved quality of life</td>
<td>178</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>Reduced obesity levels</td>
<td>163</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>Reduced state Medicaid expenditures</td>
<td>144</td>
<td>58</td>
</tr>
<tr>
<td>5</td>
<td>Improved employee productivity</td>
<td>98</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>Reduced absenteeism</td>
<td>77</td>
<td>31</td>
</tr>
<tr>
<td>7</td>
<td>Other</td>
<td>22</td>
<td>9</td>
</tr>
</tbody>
</table>

*N = 247

Respondents were also asked to identify the potential barriers that prevented them from supporting the hypothetical obesity reduction measures. Legislators were to think about only those measures they did not support. For example, if a legislator did not support the taxation-related measures, perceived barriers would be based on only those measures. There were 7 perceived barrier response options: difficulty of implementation, not the role of government, personal beliefs, monetary costs to constituents, special interest opposition, and constituent opposition. The range for a perceived barrier score was 0-7. Only two of the barrier items were supported by more than 50% of the legislators. The most frequently cited barrier to supporting the obesity prevention measures was that it is not the role of government to pass such measures. The second most common barrier was that passing the measures would cost constituents money.

Table 4.14 ranks each of the perceived barriers in order from most often selected to least often selected. Table 4.15 depicts how the respondents differed in their perceived benefits and barriers by key demographic characteristics. Table 4.16 depicts how the respondents differed in their perceived benefits and barriers by key political characteristics.
Table 4.14: Rank Order of Perceived Barriers

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not the role of government</td>
<td>166</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>Monetary costs to constituents</td>
<td>125</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>Difficulty of implementation</td>
<td>83</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>Constituent opposition</td>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Personal beliefs</td>
<td>64</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>Special interest opposition</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>Other</td>
<td>21</td>
<td>9</td>
</tr>
</tbody>
</table>

\[N = 247\]

Table 4.15: Perceived Benefits and Barriers by Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>Perceived Benefits (M, SD)(^1)</th>
<th>Perceived Barriers (M, SD)(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex:</td>
<td>Male</td>
<td>189</td>
<td>3.4 (2.1)(^a)</td>
<td>2.3 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>53</td>
<td>4.1 (1.9)(^a)</td>
<td>2.4 (1.6)</td>
</tr>
<tr>
<td>Race:</td>
<td>White</td>
<td>189</td>
<td>3.4 (2.1)</td>
<td>2.4 (1.5)(^a)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>49</td>
<td>4.0 (2.0)</td>
<td>1.8 (1.4)(^a)</td>
</tr>
<tr>
<td>Education:</td>
<td>&lt; Bachelor’s</td>
<td>36</td>
<td>3.3 (2.0)</td>
<td>2.5 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s</td>
<td>91</td>
<td>3.7 (2.2)</td>
<td>2.5 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Masters</td>
<td>57</td>
<td>3.8 (2.0)</td>
<td>2.4 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Doctoral</td>
<td>45</td>
<td>3.4 (1.8)</td>
<td>1.8 (1.4)</td>
</tr>
<tr>
<td>Geographic Region:</td>
<td>West</td>
<td>69</td>
<td>3.5 (3.4)</td>
<td>2.4 (1.5)</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>66</td>
<td>3.9 (1.9)</td>
<td>2.0 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Midwest</td>
<td>62</td>
<td>3.2 (2.2)</td>
<td>2.4 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Northeast</td>
<td>45</td>
<td>3.4 (2.3)</td>
<td>2.1 (1.5)</td>
</tr>
<tr>
<td>BMI Category:</td>
<td>Normal</td>
<td>79</td>
<td>3.9 (2.0)</td>
<td>2.2 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>96</td>
<td>3.2 (2.0)</td>
<td>2.3 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Obese</td>
<td>49</td>
<td>3.7 (2.1)</td>
<td>2.3 (1.5)</td>
</tr>
</tbody>
</table>

\[N = 250\]

*Note*: Numbers may not add to 250 due to missing data.

\(^1\)Potential range = 0 – 7

Letters denote paired significant differences with lower-case letters = \(p < .05\) and capitalized letters = \(p < .01\)
Table 4.16: Perceived Benefits and Barriers by Political Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>Perceived Benefits ($M, SD$)$^1$</th>
<th>Perceived Barriers ($M, SD$)$^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political role:</td>
<td>Legislator</td>
<td>189</td>
<td>3.5 (2.1)</td>
<td>2.2 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Aide</td>
<td>39</td>
<td>3.3 (1.7)</td>
<td>2.5 (1.3)</td>
</tr>
<tr>
<td>Political Affiliation:</td>
<td>Republican</td>
<td>116</td>
<td>2.7 (2.0)$^A$</td>
<td>2.5 (1.4)$^A$</td>
</tr>
<tr>
<td></td>
<td>Democrat</td>
<td>115</td>
<td>4.4 (1.8)$^A$</td>
<td>2.0 (1.6)$^A$</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>11</td>
<td>3.1 (1.9)</td>
<td>2.4 (1.5)</td>
</tr>
<tr>
<td>Legislative Chamber:</td>
<td>House</td>
<td>170</td>
<td>3.5 (1.8)</td>
<td>2.2 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Senate</td>
<td>72</td>
<td>3.5 (1.2)</td>
<td>2.4 (1.5)</td>
</tr>
<tr>
<td>Second Career</td>
<td>Dual career</td>
<td>163</td>
<td>3.5 (2.1)</td>
<td>2.2 (1.5)</td>
</tr>
<tr>
<td></td>
<td>Legislator only</td>
<td>75</td>
<td>3.6 (2.1)</td>
<td>2.3 (1.6)</td>
</tr>
</tbody>
</table>

$N = 250$

*Note:* Numbers may not add to 250 due to missing data.

$^1$Potential range $= 0 – 7$

Letters denote paired significant differences with lower-case letters $= p < .05$ and capitalized letters $= p < .01$

Males and females did not differ significantly on number of perceived benefits ($t = -2.181, df = 240, p = .03$). There was also no significant difference between White respondents and respondents from other racial categories on number of perceived benefits ($t = -1.783, df = 236, p = .07$). In comparison, an ANOVA showed legislators did differ significantly on perceived benefits by political party ($F = 25.408, df = 2, p < .001$). Post-hoc Bonferroni tests showed that Democrats ($M = 4.4, SD = 1.8$) cited significantly more benefits to passing the obesity reduction measures than did Republicans ($M = 2.7, SD = 2.0$). There was no significant difference between Democrats and “other” political
affiliations \((M = 3.1, SD = 1.9)\) nor between Republicans and “other” political affiliations.

There was no difference in number of perceived benefits by BMI category or geographic region. However, legislators who perceived obesity to be a “very serious” societal matter \((M = 4.3, SD = 1.9)\) reported significantly more benefits to passing the obesity reduction measures than did those respondents who perceived obesity to be a “somewhat serious” matter \((M = 2.8, SD = 1.9; t = 5.706, df = 220, p < .001)\). ANOVA also showed that legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” \((M = 5.0, SD = 1.6)\) perceived significantly more benefits \((F = 42.445, df = 2, p < .001)\) to passing obesity reduction measures than did legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts \((M = 3.6, SD = 1.8)\). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” \((M = 2.4, SD = 1.9)\) found significantly fewer benefits to passing the obesity reduction measures than both legislators who preferred government to legislate obesity prevention efforts “always/often” \((p < .001)\) and “sometimes” \((p < .001)\).

In terms of perceived barriers to passing obesity reduction measures, the number of perceived barriers did not vary significantly by sex \((t = 0.080, df = 241, p = .94)\) or by race \((t = 2.328, df = 237, p = .02)\). Political affiliation did show significant differences \((F = 4.102, df = 3, p = .02)\). Republicans \((M = 2.5, SD = 1.4)\) perceived significantly more barriers to passing the obesity reduction measures than did Democrats \((M = 2.0, SD = 1.6)\). The difference between Republicans and “other” \((M = 2.4, SD = 1.5)\) was non-significant.
Respondents did not significantly vary in number of perceived barriers by BMI category, geographic region, or perception of obesity as a serious societal problem. However, respondents who felt government should “sometimes” ($M = 2.5$, $SD = 1.5$) or “seldom/never” ($M = 2.5$, $SD = 1.3$) be involved in legislating obesity prevention efforts perceived significantly more barriers ($F = 7.953$, $df = 2$, $p < .001$) than respondents who felt government should “always/often” ($M = 1.7$, $SD = 1.3$) be involved in legislating obesity prevention efforts.

### 4.8 Linear Regression

Linear regression analysis was performed to determine which state legislator characteristics were most predictive of support for obesity reduction measures. Various independent variables needed to be dummy coded in order for the SPSS program to function properly prior to running the linear regression analysis. The variables dummy coded were legislator sex, race, political affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of government involvement in legislating obesity prevention efforts, and personal belief on the proper focus of obesity reduction efforts. The new dummy-coded variables (predictor variables) were entered as blocks and regressed in separate analyses on three criterion variables: support for public school measures, support for community-based measures, and support for taxation-related measures. Table 4.17 depicts the change in $R^2$ for the predictor variables with significant results denoted by asterisks. Non-significant predictors (level of education, geographic region, BMI category, and sex) are not shown. Predictors are listed in the order they were entered into the model.
Table 4.17: Amount of the Criterion Variance Explained ($R^2$ change) by Each Predictor Variable for Support for Obesity Reduction Measures

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Support for Public School Measures $R^2$ change</th>
<th>Support for Community Measures $R^2$ change</th>
<th>Support for Taxation Measures $R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Affiliation</td>
<td>.359***</td>
<td>.436***</td>
<td>.240***</td>
</tr>
<tr>
<td>Preferred Level of Government</td>
<td>.130***</td>
<td>.124***</td>
<td>.076***</td>
</tr>
<tr>
<td>Involvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceiving Obesity as a Serious</td>
<td>.023**</td>
<td></td>
<td>.013**</td>
</tr>
<tr>
<td>Societal Problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper Focus of Obesity Prevention</td>
<td>.021**</td>
<td></td>
<td>.023*</td>
</tr>
<tr>
<td>Efforts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>.012*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, ** p < .01, ***p < .001

The $R^2$ value indicates the proportion of variance within the criterion variables (public school, community, or taxation measures) accounted for by the predictor variable.

Political affiliation had the highest $R^2$ values for each of the three criterion variables making it the strongest predictor variable. Political affiliation accounted for 36% of the variance in support for public school measures, 44% of the variance in support for community-based measures, and 24% of the variance in support for taxation-related measures ($p < .001$). The next strongest predictor was preferred level of government involvement (i.e. government should always/often, sometimes, or seldom/never be involved in legislating obesity reduction measures). This variable was a significant predictor of the variance in support for public school measures (13%), community-based measures (12%), and taxation-related measures (8%). One other predictor variable (perception of obesity as a serious societal problem) made a significant contribution to the regression model on two of the criterion variables. Perception of obesity as a serious societal problem accounted for a significant portion of the variance in support for public school measures (2%, $p < .01$) and support for taxation-related measures (1%, $p < .05$).
The predictor “proper focus of obesity prevention efforts” (personal factors, environmental factors, or both) was a significant predictor of variance in support for community-based measures \( (p < .01) \) and taxation-related measures \( (p < .01) \). This predictor accounted for 2% of the variance in each criterion. The variable Race rose to significance in support for community-based measures accounting for 1% of the variance in that criterion. The two strongest predictor variables (political affiliation and preferred level of government involvement) accounted for 49%, 56%, and 32% of the variance in support for public school measures, community-based measures, and taxation-related measures, respectively.

4.9 Hypotheses Tests

The hypotheses presented in Chapter 1 are revisited below with accompanying accept/reject explanations. The \( p \) value was set at a conservative .01 in order to decrease the type I error rate.

*Research Question 1:* Do state legislators support obesity reduction measures in public schools?

1.1: **There is no statistically significant difference in legislator support for obesity reduction measures in public schools by sex.**

Females \( (M = 8.7, SD = 3.4) \) were significantly more likely than males \( (M = 7.2, SD = 3.4) \) to be supportive of obesity reduction measures in public schools \( (t = -2.713, df = 233, p = .007) \). Therefore, this hypothesis was rejected.
1.2: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by race.

Respondents who categorized themselves as White ($M = 7.3$, $SD = 3.3$) were significantly less supportive of obesity reduction measures in public schools than non-White respondents ($M = 8.8$, $SD = 3.5$; $t = -2.713$, $df = 233$, $p = .007$). Therefore, this hypothesis was rejected.

1.3: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by party affiliation.

This hypothesis was rejected ($F = 61.433$, $df = 2$, $p < .001$). Post-hoc Bonferroni tests showed that Democrats ($M = 9.7$, $SD = 2.1$) were significantly more likely to support obesity reduction measures in public schools than both Republicans ($M = 5.6$, $SD = 3.4$) and respondents classified as “other” in terms of political affiliation ($M = 7.3$, $SD = 3.3$). Republicans and respondents classified as “other” in terms of political affiliation did not differ significantly from one another.

1.4: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by BMI category.

Legislator support for obesity reduction measures in public schools did not significantly differ by BMI category ($F = 1.509$, $df = 2$, $p = .22$). Therefore, this hypothesis was accepted.

1.5: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by geographic region.
Legislator support for obesity reduction measures in public schools did not significantly differ by geographic region ($F = 2.497$, df = 3, $p = .06$). Therefore, this hypothesis was accepted.

1.6: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by perceived problem of obesity in society. This hypothesis was rejected ($t = 6.133$, df = 213, $p < .001$). Legislators who perceived obesity to be a “very serious” societal problem ($M = 9.0$, $SD = 2.7$) were significantly more likely to support obesity reduction measures in public schools than were legislators who perceived obesity to be a “somewhat” serious societal problem ($M = 6.3$, $SD = 3.6$).

1.7: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by preferred level of governmental involvement in legislating obesity prevention efforts. This hypothesis was rejected ($F = 90.827$, df = 2, $p < .001$). Post-hoc Bonferroni tests showed that legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” ($M = 10.2$, $SD = 1.6$) were significantly more supportive of obesity reduction measures in public schools than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts ($M = 8.6$, $SD = 2.4$). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” ($M = 4.9$, $SD = 3.2$) were significantly less likely to be supportive of obesity reduction measures in public schools than both legislators who preferred government to
“sometimes” be involved and legislators who preferred government to
“always/often” be involved.

1.8: There is no statistically significant relationship between legislator support for
obesity reduction measures in public schools and number of perceived benefits to
passing such measures.

This hypothesis was rejected ($r = .60, p < .001$). There was a significant and
moderately strong, positive relationship between legislator support for obesity
reduction measures in public schools and number of perceived benefits to passing
such measures.

1.9: There is no statistically significant relationship between legislator support for
obesity reduction measures in public schools and number of perceived barriers to
passing such measures.

There was a statistically significant but weak, negative relationship between
legislator support for obesity reduction measures in public schools and number of
perceived barriers to passing such measures ($r = -.17, p = .01$). Therefore, this
hypothesis was rejected.

Research Question 2: Do state legislators support obesity reduction measures in the
community?

2.1: There is no statistically significant difference in legislator support for obesity
reduction measures in the community by sex.
This hypothesis was rejected ($t = -3.201, \text{df} = 229, p = .002$). Females ($M = 9.0, SD = 4.8$) were significantly more likely to support obesity reduction measures in the community than were males ($M = 6.6, SD = 4.7$).

2.2: **There is no statistically significant difference in legislator support for obesity reduction measures in the community by race.**

This hypothesis was rejected ($t = -4.785, \text{df} = 225, p < .001$). White legislators ($M = 6.5, SD = 4.5$) were significantly less likely to support obesity reduction measures in the community than were non-White legislators ($M = 10.1, SD = 4.8$).

2.3: **There is no statistically significant difference in legislator support for obesity reduction measures in the community by party affiliation.**

This hypothesis was rejected ($F = 90.297, \text{df} = 2, p < .001$). Post-hoc Bonferroni tests showed that Democrats ($M = 10.6, SD = 3.8$) were significantly more likely to support obesity reduction measures in the community than both Republicans ($M = 4.2, SD = 3.5$) and respondents classified as “other” in terms of political affiliation ($M = 4.9, SD = 3.5$). Republicans and respondents classified as “other” in terms of political affiliation did not differ significantly from one another.

2.4: **There is no statistically significant difference in legislator support for obesity reduction measures in the community by BMI category.**

Legislator support for obesity reduction measures in the community did not significantly differ by BMI category ($F = 1.448, \text{df} = 2, p = .24$). Therefore, this hypothesis was accepted.

2.5: **There is no statistically significant difference in legislator support for obesity reduction measures in the community by geographic region.**
This hypothesis was rejected \((F = 5.105, \text{df} = 3, p = .002)\). Post-hoc Bonferroni tests showed that legislators in the South \((M = 8.7, SD = 4.6)\) were significantly more likely to support obesity reduction measures in the community than legislators in the Midwest \((M = 5.5, SD = 4.4)\). Legislators in the West \((M = 7.0, SD = 4.9)\) and Northeast \((M = 7.2, SD = 4.7)\) did not significantly differ in their support from Midwestern or Southern legislators or from each other.

2.6: There is no statistically significant difference in legislator support for obesity reduction measures in the community by perceived problem of obesity in society.

This hypothesis was rejected \((t = 6.109, \text{df} = 209, p < .001)\). Legislators who perceived obesity to be a “very serious” societal problem \((M = 9.0, SD = 4.5)\) were significantly more likely to support obesity reduction measures in the community than were legislators who perceived obesity to be a “somewhat” serious societal problem \((M = 5.3, SD = 4.2)\).

2.7: There is no statistically significant difference in legislator support for obesity reduction measures in the community by preferred level of governmental involvement in legislating obesity prevention efforts.

This hypothesis was rejected \((F = 111.124, \text{df} = 2, p < .001)\). Post-hoc Bonferroni tests showed that legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” \((M = 11.7, SD = 3.5)\) were significantly more supportive of obesity reduction measures in the community than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts \((M = 8.0, SD = 3.7)\). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” \((M =
3.6, $SD = 3.1$) were significantly less likely to be supportive of obesity reduction measures in the community than both legislators who preferred government to “sometimes” be involved and legislators who preferred government to “always/often” be involved.

2.8: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived benefits to passing such measures.

This hypothesis was rejected ($r = .61, p < .001$). There was a significant and moderately strong, positive relationship between legislator support for obesity reduction measures in the community and number of perceived benefits to passing such measures.

2.9: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived barriers to passing such measures.

There was a statistically significant but weak, negative relationship between legislator support for obesity reduction measures in the community and number of perceived barriers to passing such measures ($r = -.27, p < .00$). Therefore, this hypothesis was rejected.

Research Question 3: Do state legislators support taxation–related obesity reduction measures?

3.1: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by sex.
This hypothesis was rejected ($z = -3.377, p = .001$). Females were significantly more supportive of taxation-related obesity reduction measures with a median of 1 compared to a median of 0 for males.

3.2: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by race.

This hypothesis was accepted ($z = -2.412, p = .02$). Members of the non-White categories were not significantly more supportive of taxation-related obesity reduction measures.

3.3: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by party affiliation.

This hypothesis was rejected, $\chi^2(2, N = 239) = 74.722, p < .001$. Follow-up tests to evaluate differences among the three party affiliations (Republican, Democrat, and Other) showed that both Democrats ($Mdn = 3$) and legislators with “other” political affiliations ($Mdn = 1$) were significantly more likely to support taxation-related obesity reduction measures than Republicans ($Mdn = 0$). Democrats and respondents classified as “other” in terms of political affiliation did not differ significantly from one another.

3.4: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by BMI category.

Legislator support for taxation-related obesity reduction measures did not significantly differ by BMI category $\chi^2(2, N = 221) = 4.415, p = .11)$. Therefore, this hypothesis was accepted.
3.5: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by geographic region.

Legislator support for taxation-related obesity reduction measures did not significantly differ by geographic location $\chi^2(3, N = 239) = 2.486, p = .48$.

Therefore, this hypothesis was accepted.

3.6: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by perceived problem of obesity in society.

This hypothesis was rejected ($z = -4.611, p < .001$). Legislators who perceived obesity to be a “very serious” societal problem ($Mdn = 1$) were significantly more likely to support taxation-related obesity reduction measures than were legislators who perceived obesity to be a “somewhat” serious societal problem ($Mdn = 0$).

3.7: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by preferred level of governmental involvement in legislating obesity prevention efforts.

This hypothesis was rejected $\chi^2(2, N = 221) = 4.415, p < .001$. Follow-up tests revealed that legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” ($Mdn = 3$) were significantly more supportive ($z = 4.181, p < .001$) of taxation-related obesity reduction measures than were legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts ($Mdn = 0$). Legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” were also significantly more supportive ($z = 8.887, p < .001$) of taxation-related measures than legislators who preferred government to legislate obesity
prevention efforts “seldom/never” \((Mdn = 0)\). Legislators who preferred
government to legislate obesity prevention efforts “seldom/never” were
significantly less likely to be supportive \((z = -5.203, p < .001)\) of taxation-related
obesity reduction than legislators who preferred government to “sometimes” be
involved.

**3.8: There is no statistically significant relationship between legislator support for
taxation-related obesity reduction measures and number of perceived benefits to passing such measures.**

This hypothesis was rejected \((r = .35, p < .001)\). There was a significant and
moderately strong, positive relationship between legislator support for taxation-
related obesity reduction measures and number of perceived benefits to passing
such measures.

**3.9: There is no statistically significant relationship between legislator support for
taxation-related obesity reduction measures and number of perceived barriers to passing such measures.**

There was a statistically significant and moderately strong, negative relationship
between legislator support for taxation-related obesity reduction measures and
number of perceived barriers to passing such measures \((r = - .40, p < .001)\).
Therefore, this hypothesis was rejected.

*Research Question 4:* What are the personal characteristics upon which state legislators
vary in perceived benefits to passing obesity reduction measures?
4.1: There is no statistically significant difference in number of perceived benefits by sex.

Males and females did not differ significantly on number of perceived benefits

\( t = -2.181, \text{df} = 240, p = .03 \). Therefore, this hypothesis was accepted.

4.2: There is no statistically significant difference in number of perceived benefits by race.

This hypothesis was accepted. There was no significant difference between

White respondents and respondents from other racial categories on number of perceived benefits \( t = -1.783, \text{df} = 236, p = .07 \).

4.3: There is no statistically significant difference in number of perceived benefits by party affiliation.

This hypothesis was rejected \( F = 25.408, \text{df} = 2, p < .001 \). Post-hoc Bonferroni tests showed that Democrats \( (M = 4.4, SD = 1.8) \) cited significantly more benefits to passing the obesity reduction measures than did Republicans \( (M = 2.7, SD = 2.0) \). There was no significant difference between Democrats and “other” political affiliations \( (M = 3.1, SD = 1.9) \) nor between Republicans and “other” political affiliations.

4.4: There is no statistically significant difference in number of perceived benefits by BMI category.

This hypothesis was accepted \( F = 2.757, \text{df} = 2, p = .06 \). There was no difference in number of perceived benefits by BMI category.

4.5: There is no statistically significant difference in number of perceived benefits by geographic region.
Number of perceived benefits did not vary by geographic region ($F = 1.574$, df = 3, $p = .20$). Therefore, this hypothesis was accepted.

4.6: There is no statistically significant difference in number of perceived benefits by perceived problem of obesity in society.

Those who felt obesity is a “very serious” societal matter ($M = 4.3$, $SD = 1.9$) perceived significantly more benefits ($t = 5.706$, df = 220, $p < .001$) to passing the obesity reduction measures than did those who felt that obesity is a “somewhat serious” matter ($M = 2.8$, $SD = 1.9$). Therefore, this hypothesis was rejected.

4.7: There is no statistically significant difference in number of perceived benefits by preferred level of governmental involvement in legislating obesity prevention efforts.

This hypothesis was rejected ($F = 42.445$, df = 2, $p < .001$). Post-hoc Bonferroni tests showed that legislators who preferred government to be involved in legislating obesity prevention efforts “always/often” ($M = 5.0$, $SD = 1.6$) found significantly more benefits to passing obesity reduction measures than did legislators who preferred government to “sometimes” be involved in legislating obesity prevention efforts ($M = 3.6$, $SD = 1.8$). Legislators who preferred government to legislate obesity prevention efforts “seldom/never” ($M = 2.4$, $SD = 1.9$) found significantly fewer benefits to passing the obesity reduction measures than both legislators who preferred government to legislate obesity prevention efforts “always/often” and “sometimes”.

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Research Question 5: What are the personal characteristics upon which state legislators vary in perceived barriers to passing obesity reduction measures?

5.1: There is no statistically significant difference in number of perceived barriers by sex.

Number of perceived barriers did not vary significantly by sex ($t = 0.080$, df = 241, $p = .94$). Therefore, this hypothesis was accepted.

5.2: There is no statistically significant difference in number of perceived barriers by race.

Number of perceived barriers did not vary significantly by race ($t = 2.328$, df = 237, $p = .02$). Therefore, this hypothesis was accepted.

5.3: There is no statistically significant difference in number of perceived barriers by party affiliation.

This hypothesis was rejected. Republicans ($M = 2.5, SD = 1.4$) perceived significantly more barriers ($F = 42.445$, df = 2, $p < .001$) to passing the obesity reduction measures than did Democrats ($M = 2.0, SD = 1.6$). The difference between Republicans and “other” ($M = 2.4, SD = 1.5$) was not significant.

5.4: There is no statistically significant difference in number of perceived barriers by BMI category.

Respondents did not significantly vary in number of perceived barriers by BMI category. Therefore, this hypothesis was accepted.

5.5: There is no statistically significant difference in number of perceived barriers by geographic region.
This hypothesis was accepted. There was no significant difference in number of perceived barriers by geographic region ($F = 1.000$, df = 3, $p = .39$).

5.6: There is no statistically significant difference in number of perceived barriers by perceived problem of obesity in society.

This hypothesis was accepted. There was no significant difference in number of perceived barriers by perceived problem of obesity in society ($t = -1.073$, df = 221, $p = .28$).

5.7: There is no statistically significant difference in number of perceived barriers by preferred level of governmental involvement in legislating obesity prevention efforts.

This hypothesis was rejected ($F = 7.953$, df = 2, $p < .001$). Post-hoc Bonferroni tests showed respondents who felt government should “sometimes” ($M = 2.5$, $SD = 1.5$) or “seldom/never” ($M = 2.5$, $SD = 1.3$) be involved in legislating obesity prevention efforts perceived significantly more barriers than respondents who felt government should “always/often” ($M = 1.7$, $SD = 1.3$) be involved in legislating obesity prevention efforts.

Research Question 6: What personal characteristics predict legislator support for obesity reduction measures in public schools?

6.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal
beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in public schools.

This hypothesis was rejected. Party affiliation ($R^2 = .359$) was a significant predictor $[F(2, 189) = 52.845, p < .001]$, preferred level of government involvement in legislating obesity prevention efforts ($R^2 = .130$) was a significant predictor $[F(2, 187) = 23.870, p < .001]$, and perceiving obesity as a serious societal problem ($R^2 = .023$) was a significant predictor $[F(1, 186) = 8.929, p = .003]$ of support for obesity reduction measures in public schools.

*Research Question 7:* What personal characteristics predict legislator support for obesity reduction measures in the community?

7.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in the community.

This hypothesis was rejected. Party affiliation ($R^2 = .436$) was a significant predictor $[F(2, 182) = 70.402, p < .001]$, preferred level of government involvement in legislating obesity prevention efforts ($R^2 = .124$) was a significant predictor $[F(2, 180) = 25.250, p < .001]$, and personal beliefs on the proper focus of obesity prevention efforts ($R^2 = .021$) was a significant predictor $[F(2, 178) = 4.484, p = .01]$ of support for community-based obesity reduction measures.
Research Question 8: What personal characteristics predict legislator support for taxation-related obesity reduction measures?

8.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for taxation-related obesity reduction measures.

This hypothesis was rejected. Party affiliation ($R^2 = .240$) and preferred level of government involvement in legislating obesity prevention efforts ($R^2 = .076$) were significant predictors of support [$F(2, 190) = 30.057, p < .001$] and $F(2, 188) = 10.516, p < .001$, respectively] for taxation-related obesity reduction measures.

4.10 Summary

A total of 250 out of 800 questionnaires were returned for a response rate of 32%. Respondents did not significantly differ from non-respondents on gender, political affiliation, or chamber designation. Respondents were primarily White (79%) males (78%) who were either overweight (43%) or obese (22%) and fairly evenly split between Republicans ($n = 118$) and Democrats ($n = 122$). Support for public school and community-based measures was greater than support for taxation-related measures. Democrats, females, and members of racial categories other than “White” were significantly more supportive of the measures compared to Republicans, males, and members of the “White” racial category, respectively. Linear regression revealed that political affiliation, proper role of government, and perceiving obesity as a serious
societal problem were significant predictors of legislator support. Legislator BMI, level of education, and geographic region were not significant predictors of support. The most common benefit of passing the measures was “improved health”. The most common barrier was “not the role of government”.
Chapter 5

Conclusions

This chapter places the findings of the current study into context. It is divided into ten sections: Summary of the Study, Accepted Hypotheses, Rejected Hypotheses, Qualitative Analysis, Discussion, Implications, Recommendations for Public Health Advocates, Future Research, Conclusion, and Summary.

5.1 Summary of the Study

Obesity levels in the United States are at an all-time high (Centers for Disease Control & Prevention, 2009b). Being obese is financially costly and increases the risk for a host of diseases, such as cancer (Calle & Thun, 2004), osteoarthritis (Lementowski & Zelicof, 2008), depression (Carpenter, Hasin, Allison, & Faith, 2000), coronary heart disease (Jensen et al., 2008), and type 2 diabetes (Hanley & Wagenknecht, 2008). Since the year 2000, there has been increased interest in policy-level approaches aimed at curbing the obesity epidemic. Despite the increased use of policy approaches to reduce the obesity epidemic, the legislator characteristics that predict support for evidence-based...
obesity reduction measures are not well known. To better understand legislator support for obesity reduction measures, the following eight research questions were investigated:

1. Do state legislators support obesity reduction measures in public schools?
2. Do state legislators support obesity reduction measures in the community?
3. Do state legislators support taxation – related obesity reduction measures?
4. What are the personal characteristics upon which state legislators vary in perceived benefits to passing obesity reduction measures?
5. What are the personal characteristics upon which state legislators vary in perceived barriers to passing obesity reduction measures?
6. What personal characteristics predict legislator support for obesity reduction measures in public schools?
7. What personal characteristics predict legislator support for obesity reduction measures in the community?
8. What personal characteristics predict legislator support for taxation – related obesity reduction measures?

Seventeen hypothetical measures were gleaned from the literature and sent via a valid and reliable survey questionnaire to a random sample of 800 state legislators from all 50 United States. The sample was proportionally stratified so as to contain 16 legislators from each state. Legislators were asked to rate their level of support for each of the 17 hypothetical measures, rate how impactful each measure could be at reducing their state’s obesity level, and identify potential benefits and barriers to the measures. There were 250 questionnaires returned for a 32% response rate. Principal components
analysis revealed that the 17 hypothetical measures consisted of three factors: public school measures ($n = 6$), community-based measures ($n = 8$), and taxation-related measures ($n = 3$).

Overall, public school and community-based measures were supported at approximately the same levels. Taxation-related measures were not well supported. Democrats, females, and non-White legislators were significantly more supportive of the taxation measures compared to Republicans, males, and White legislators, respectively. Linear regression analysis revealed that political affiliation, preferred level of government involvement into obesity reduction matters, and perceiving obesity as a serious societal problem were the three principal predictors of legislator support for public school measures. Political affiliation, preferred level of government involvement into obesity reduction matters, and beliefs about where obesity reduction efforts should focus (personal factors versus environmental factors) were the best predictors of both support for community-based measures and support for taxation-related measures. Legislator BMI, level of education, and geographic region were not significant predictors of support for public school, community-based, or taxation-related measures.

The most common benefit of passing the measures was “improved health”. The most common barrier was “not the role of government”. Public health advocates interested in promoting obesity prevention legislation at the state level are most likely to find support for their interests among non-White, female, Democratic legislators regardless of BMI who perceive obesity to be a serious societal problem. Unfortunately, legislators with these demographic characteristics are rare in most states. Convincing
legislators that obesity prevention efforts are under the government’s purview may lead to more successful advocacy.

5.2 Accepted Hypotheses

The following 16 out of 44 null hypotheses (36%) were accepted:

1.4: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by BMI category.

1.5: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by geographic region.

2.4: There is no statistically significant difference in legislator support for obesity reduction measures in the community by BMI category.

3.4: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by BMI category.

3.5: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by geographic region.

4.1: There is no statistically significant difference in number of perceived benefits by sex.

4.2: There is no statistically significant difference in number of perceived benefits by race.

4.4: There is no statistically significant difference in number of perceived benefits by BMI category.

4.5: There is no statistically significant difference in number of perceived benefits by geographic region.

5.1: There is no statistically significant difference in number of perceived barriers by sex.
5.2: There is no statistically significant difference in number of perceived barriers by race.

5.3: There is no statistically significant difference in number of perceived barriers by party affiliation.

5.4: There is no statistically significant difference in number of perceived barriers by BMI category.

5.5: There is no statistically significant difference in number of perceived barriers by geographic region.

5.6: There is no statistically significant difference in number of perceived barriers by perceived problem of obesity in society.

5.7: There is no statistically significant difference in number of perceived barriers by preferred level of governmental involvement in legislating obesity prevention efforts.

5.3 Rejected Hypotheses

The following 28 out of 44 null hypotheses (64%) were accepted:

1.1: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by sex.

1.2: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by race.

1.3: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by party affiliation.

1.6: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by perceived problem of obesity in society.
1.7: There is no statistically significant difference in legislator support for obesity reduction measures in public schools by preferred level of governmental involvement in legislating obesity prevention efforts.

1.8: There is no statistically significant relationship between legislator support for obesity reduction measures in public schools and number of perceived benefits to passing such measures.

1.9: There is no statistically significant relationship between legislator support for obesity reduction measures in public schools and number of perceived barriers to passing such measures.

2.1: There is no statistically significant difference in legislator support for obesity reduction measures in the community by sex.

2.2: There is no statistically significant difference in legislator support for obesity reduction measures in the community by race.

2.3: There is no statistically significant difference in legislator support for obesity reduction measures in the community by party affiliation.

2.5: There is no statistically significant difference in legislator support for obesity reduction measures in the community by geographic region.

2.6: There is no statistically significant difference in legislator support for obesity reduction measures in the community by perceived problem of obesity in society.

2.7: There is no statistically significant difference in legislator support for obesity reduction measures in the community by preferred level of governmental involvement in legislating obesity prevention efforts.
2.8: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived benefits to passing such measures.

2.9: There is no statistically significant relationship between legislator support for obesity reduction measures in the community and number of perceived barriers to passing such measures.

3.1: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by sex.

3.2: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by race.

3.3: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by party affiliation.

3.6: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by perceived problem of obesity in society.

3.7: There is no statistically significant difference in legislator support for taxation-related obesity reduction measures by preferred level of governmental involvement in legislating obesity prevention efforts.

3.8: There is no statistically significant relationship between legislator support for taxation-related obesity reduction measures and number of perceived benefits to passing such measures.

3.9: There is no statistically significant relationship between legislator support for taxation-related obesity reduction measures and number of perceived barriers to passing such measures.
4.3: There is no statistically significant difference in number of perceived benefits by party affiliation.

4.6: There is no statistically significant difference in number of perceived benefits by perceived problem of obesity in society.

4.7: There is no statistically significant difference in number of perceived benefits by preferred level of governmental involvement in legislating obesity prevention efforts.

6.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in public schools.

7.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for obesity reduction measures in the community.

8.1: Legislator sex, race, party affiliation, level of education, BMI category, geographic region, perceived problem of obesity in society, preferred level of governmental involvement in legislating obesity prevention efforts, and personal beliefs on the proper focus of obesity reduction efforts are all equally predictive of legislator support for taxation-related obesity reduction measures.
5.4 Qualitative Analysis

Obtaining an adequate response rate is a crucial element for claiming external validity of the findings and is often a necessary condition for successful publication in well-regarded, peer-reviewed journals. Therefore, a discussion of the steps taken to mitigate the low-response rate obtained in the present study is warranted. There was substantial difficulty involved in procuring questionnaires from the state legislators. This difficulty was anticipated and was seriously considered prior to study commencement. The risk of obtaining a low response rate from surveying “hard-to-reach” participants, such as state legislators, was weighed against the unique contribution of the study population and the potential for obtaining very useful results.

Ultimately, the decision was made to use state legislators as the sample (as opposed to mayors, governors, or school superintendents) because legislators have the power to draft and vote on bills that become state laws. The subsequent low response rate of 32% may have been due to several factors. State legislators are inundated with surveys and other requests for their time which causes many legislators to impose a blanket “no response” policy for any surveys they receive (W. Cassidy, personal communication, September 2, 2011). One questionnaire was returned blank with a note attached stating “Since I was grossly misrepresented in a survey, I have made it office policy not to respond”. Over the course of the study it was discovered that six legislative offices had “do not respond” policies. The number of additional legislative offices with similar blanket no response policies remains conjecture. Although the importance of the study may have changed at least one respondent’s blanket no response policy as evidenced by this quote from the “other comments” section of a questionnaire:
“My position over the past 35 yrs in politics is that I don’t do surveys. However I will make an exception this time because of the importance of reducing obesity”

Five waves of communication were attempted to gather data from state legislators. The first wave mailing consisted of a survey sent to the legislator’s district office along with an email notification. This wave procured 117 completed questionnaires. The second wave mailing was sent to the legislator’s home and procured 82 usable questionnaires. Sending the second wave to the legislator’s home was done in an attempt to improve on the meager response rate (15%) obtained from wave one and potentially reach those legislators out of session. Doing this may have inadvertently interrupted the three wave mailing technique that has been shown to increase response rates (King et al., 2001). The third mailing went to the legislator’s district office and resulted in 50 usable surveys. The fourth wave was an email and provided only one additional survey. The fifth wave of phoning 30 legislators provided zero questionnaires.

It is important to note that there was no financial incentive provided in the mailings, as is customary in survey studies, because the population being studied consisted of public servants. Providing an incentive for participation could be misconstrued as bribery. Being able to include a $1 bill may have improved the response rate. It has been shown that providing a modest incentive can increase survey response rates by as much as 8 to 19% (Church, 1993). Alternatively, the state legislators were offered an executive summary of the findings upon study completion as an incentive.

Another factor that potentially hurt response rate was that none of the researchers conducting the study were citizens living in the legislators’ districts (with the exception
of Ohio). A legislator’s reluctance to participate in an activity being conducted by a non-constituent (i.e. someone who has no direct influence on voting for or against the legislator) may have contributed to the low response rate. A legislator may perceive less pressure to help a person who has no ability to vote legislators in or out of office. Evidence of this phenomenon exists in that the state of Ohio (where the sponsoring institution is located) was second only to Nebraska in total number of respondents (9 and 10, respectively). Non-responding legislators may also perceive obesity to be a personal rather than public problem, especially given the current environment of deregulation.

Despite the low response rate, there were results indicating the sample obtained was not biased substantially. Almost 80% of those who sent in questionnaires were actual legislators (as opposed to legislative aids). Furthermore, the legislators who did respond were fairly evenly distributed by geographic region. As noted in Chapter 4, there were no significant differences between respondents and non-respondents in terms of sex, political affiliation, and chamber. The fact that there was no significant difference between the respondents and non-respondents by political affiliation is especially encouraging for external validity because political affiliation was by far the strongest predictor of support for the obesity reduction measures. Additionally, the sample was randomly selected from the population at large which, theoretically, helps control for potential idiosyncrasies within the subjects. Post-hoc power analyses indicated that obtaining 250 questionnaires and not reaching the recommended sample size of 366 resulted in a margin of error increase of only 0.85% (see Chapter 4-Section 4.1). Lastly, larger samples, in general, improve the generalizability of research results arising from factor analysis (DeVellis, 2003). It has been suggested that a sample size of 200 is
sufficient for performing factor analytic techniques, such as Principal Components analysis, on up to 40 items (Comrey, 1988). Another rule of thumb suggests that a ratio of 5 to 10 subjects per factored item is adequate (Tinsley & Tinsley, 1988). These criteria were easily met for the statistical analyses described in Chapters 3 and 4. Lastly, 32% response rate is similar to recent studies of state legislators (Schwarte, 2010).

5.5 Discussion

There were several noteworthy findings in the present study. Overall, support for obesity reduction measures was stronger among Democrats, females, members of non-White racial groups, those who perceive obesity to be a serious societal problem, and those who believe government should “always/often” be involved in legislating obesity reduction measures. Table 5.1 organizes the key findings.

Table 5.1: Characteristics that Explain Legislator Support for Obesity Reduction Measures

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Significant Univariate Results</th>
<th>Significant Multivariate Results</th>
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<tbody>
<tr>
<td></td>
<td>Public School Measures</td>
<td>Community Measures</td>
</tr>
<tr>
<td>Sex</td>
<td>XX</td>
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<tr>
<td>Race</td>
<td>XX</td>
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<tr>
<td>Education level</td>
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<td>Geography</td>
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<tr>
<td>Political role</td>
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<tr>
<td>Political affiliation</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>Perceiving obesity as a serious societal problem</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>Proper role of government</td>
<td>XX</td>
<td>XX</td>
</tr>
<tr>
<td>Focus of obesity reduction efforts</td>
<td>XX</td>
<td>XX</td>
</tr>
</tbody>
</table>

\(N = 250\)

*Note*: Legislators did not differ significantly in their support for obesity reduction measures by BMI, chamber (house vs. senate) or having a career outside of politics. \(X = p < .05\), \(XX = p < .01\)
The finding that principal components analysis yielded a 3 factor solution was interesting. The initial report from the Centers for Disease Control and Prevention broke the hypothetical obesity reduction measures into five categories. This lends evidence to the notion that legislators and academicians may have different views regarding how solutions to the obesity problem are organized.

Geographic location was not a significant predictor of support for obesity reduction measures. Geography rose to the level of significance only when comparing legislators from the South to the Midwest on community-based measures. Southern legislators may be more supportive of community-based measures because obesity disproportionately affects disadvantaged groups (Swinburn et al., 2011). Overall, geography was not as important for explaining legislator support as was political affiliation, perceived seriousness of the obesity problem, and preferred level of government involvement. This finding is particularly important given that many studies of state legislators compare legislators by region (Maestas et al., 2003). The practice of studying legislators by region when obesity prevention/reduction is at issue requires careful consideration.

A little over one-third of the legislators (35%) were in the normal category for BMI range. However, BMI was not predictive of support for obesity reduction measures. Moreover, unlike geographic region, BMI did not produce significant differences in support for any of the hypothetical measures, although a comparison of means shows obese legislators were more supportive of both overweight and normal weight legislators. It is interesting to note that, according to self-reported height and weight values, the responding legislators were dissimilar to the general population in obesity prevalence.
The general population displays a higher prevalence of obesity (34% vs. 22%) but a lower prevalence of overweight (34% vs. 43%) than the respondents (Centers for Disease Control & Prevention, 2010c).

Support for obesity reduction measures in public schools was strong among Democrats regardless of BMI, education level, geographic location, chamber designation, or having a career outside of politics. This is encouraging because, as one respondent stated: “K-12 schools is where you should start”. The early years of life are crucial to an individual’s psychological and physical development. Behaviors learned during this time period affect virtually every aspect of that person’s well-being as an adult. This is the stage when healthy habits are first practiced and engrained (or not). When youths successfully adopt healthy behavior patterns, there is increased likelihood that they will become active, healthy adults (Pate et al., 1996). Simply put, habitual physical activity established during the early years may have the greatest impact on obesity levels, mortality rates, and longevity for the next generation (Hills, King, & Armstrong, 2007).

Young children and adolescents spend the majority of their day at school, yet daily participation in high school physical education classes dropped from 42% in 1991 to 33% in 2005. A full two-thirds of young people in grades 9-12 are not engaged in sufficient levels of physical activity (Centers for Disease Control & Prevention, 2010a). Furthermore, only half of individuals aged 12 to 21 years report regular involvement in vigorous physical activity and one fourth report no vigorous activity, with African American female youths having the lowest reported activity levels of all demographic groups (Ogden, Flegal, Carroll, & Johnson, 2002).
African American female youths are not alone in their lack of adequate physical activity. Adolescent girls in general report lower levels of physical activity than boys. Longitudinal data shows that, while physical activity levels decline across adolescence for both genders, girls show a larger overall decline. The decline in physical activity across adolescence in both genders is predicted by physical maturation, self-efficacy, friend support, and friend activity levels (Duncan, Duncan, Strycker, & Chaumeton, 2007). Remedies aimed at increasing physical activity levels in the youth population are needed within public schools. Public school physical education classes provide relatively low-risk alternatives for overweight youths who need to increase their physical activity levels for obesity prevention (Lowry et al., 2007). Results from the present study suggest that legislators may be receptive to increasing current physical education requirements to daily, yearlong endeavors. Such requirements could “force” schools to include more than a focus on just standardized test scores.

Additional policies could be aimed at increasing the number of children who walk or bike to school. Only 31% of children ages 5 to 15 who live within one mile of school choose to walk there each day and less than 3% of children ages 5 to 15 living within two miles of school choose to ride their bicycles (Centers for Disease Control and Prevention, 2010b). Efforts to communicate the importance of physical activity to children and families, along with policy changes regarding busing routes, could increase these percentages.

Parents need to play a role in this debate as was astutely noted in the comments section by two of the responding legislators. They said “What is the role of parents and personal responsibility?” and “Whatever happened to personal responsibility and training
parents.” There is evidence that buttresses the common-sense notion of the necessity of parental involvement to improve childhood obesity levels. In South Carolina, a study conducted on 421 girls in 8th, 9th, and 12th grades found that girls who reported lower family support at the 8th grade had more rapid declines in physical activity levels than girls who reported higher family support at the 8th grade (Dowda, Dishman, Pfeiffer, & Pate, 2007). The authors concluded that family support prior to the 8th grade can mitigate declines in physical activity levels in adolescent girls.

Educating parents about the importance of physical activity for long-term health is not sufficient to reduce obesity levels in youths. In addition to this, legislators could potentially call for physical education class activities to be modified to increase the amount of time youths spend running, jumping, or performing vigorous activities. School policies that require integrating physical activity into school subjects like math, science, and biology could also prove beneficial.

The hypothetical community-based obesity reduction measures, like the public school measures, were more highly supported by Democrats, females, members of non-White racial categories, those who perceived obesity to be a serious societal problem, and by those more accepting of government involvement in obesity reduction efforts. The strong overall support of community-based measures shown by some legislators is encouraging given the glut of current environmental impediments to healthy lifestyles (Swinburn et al., 2011). Focus on changing the built environment to support obesity prevention efforts is desperately needed. Physical activity, it seems, has been engineered out of our surroundings. Nationwide, very few roadways contain bike paths and city streets are often designed for car traffic with pedestrian traffic an afterthought. The fast-
paced American culture has embraced numerous devices like self-propelled lawn mowers, leaf blowers, and moving walkways in an attempt to save time and effort. This is the country where the “employee of the month” gets rewarded by being given the parking spot closest to the entrance. Policies that incentivize creation of pedestrian-friendly, attractive neighborhoods are needed to increase the likelihood that people within those environments will be physically active (Ball, Bauman, & Owen, 2001). Barriers to exercise such as uneven terrain, unattended dogs, heavy traffic, lack of streetlights, and high levels of crime also need to be addressed in order for people to become more active (King et al., 2000). Environmental drivers of obesity such as these must be given more serious consideration by state legislators.

Political party affiliation (Democrat, Republican, and “other”) was shown to be the strongest predictor of support for public school, community-based and taxation-related obesity reduction measures. This result was anticipated given that Democrats and Republicans, in general, have disparate views on the proper role of government. Republicans typically espouse individualism, personal responsibility, the free market, and minimal government involvement (Anderson, 2006, p. 130). The following are selected comments from Republican state legislators that were provided in the last section of the questionnaire. These comments are provided here to highlight the foundational differences between Democrats and Republicans in terms of their perceived proper place of government in the obesity debate (a full listing of “other” comments can be read in Appendix K):

“We have too damn much govt. regulation already.”

“Whatever happened to personal responsibility and training parents. Government has no place in this issue”
“We don't need the govt to be the fat police. This is not the job of the government. Eating & exercise are personal choices. If you choose to over eat, eat the wrong foods, refrain from exercise - you should have to pay more for your health insurance. If you are on a gov't plan, you should be surcharged over and above what others pay for co-pays etc. if you are overweight”.

“This is among many of the US societal problems. It is time our media get with the program & start conveying old fashioned ideals making homemade meals being one of them. Sexual behaviors etc. - create an attitude of it feels good do it; if it tastes good, eat it. Much of this starts at home. Parents need to get a clue & start being active with their children's diet & exercise”.

“This is an area government should stay out of. Regulating fat people is not the government's job”.

“Obesity is more about personal responsibility.”

“Obesity/health care is a major issue for our society. Will get push back if government mandates food consumption. Education will drive the changes needed”.

“People need to take personal responsibility. Not the role of government.”

“It is not possible to legislate personal responsibility.”

“It is not the role of government to regulate society. Thank you.”

Democrats typically have a strong belief in the use of government to remedy social injustices, are generally inclined to promote consumer interests rather than corporate interests, and use policy as a means to improve the human condition (Anderson, 2006, p. 130). The following is a sample of comments Democratic legislators wrote in the final section of the questionnaire:

“It's great to see scholars doing what is necessary to research the factors of obesity and develop or implement solutions.”

“Please send results. Should have incentives to expand physical activity (youth sports).”
“A good survey, and great question. I hope we can help with this project.”

“As stated, the limited options offered deal with external factors. The roots of obesity, especially within generational poverty, are deeper and complex. Treatments need to be equally comprehensive.”

“Great survey. I realized I do not know as much about obesity and obesity prevention as I thought I did.”

“Calories should be listed on all fast foods; it is difficult to calorie count in fast food places.”

“I work in the insurance business and see the effects of obesity daily. I'm glad you are doing this survey and look forward to reading the results. My state (Idaho) is very anti telling people what to do thru legislation. Good luck! It's important.”

“Insurance companies should also be considered in legislation both to provide surgery for the obese and differentiate insurance premiums according to weight.”

These comments provide intriguing insights into legislator perceptions of what causes obesity and what legislators feel should be done to reduce population obesity levels.

Unfortunately, there seems to be more divisiveness than ever in legislatures across the country with the intensity of political battles reaching a crescendo during election years. From battles over workers’ rights to unionize in Wisconsin, Ohio, and Michigan, to political wrangling on the national stage over the Affordable Care Act of 2010 as well as the debate over national debt reduction, legislators at both state and federal levels appear to be far apart on important issues, obesity notwithstanding. This divisiveness may be partially to blame for the dearth of policy action to combat obesity at the state level. From 2001 to 2007, there were only 625 bills introduced in state legislatures that pertained directly to obesity prevention/reduction (Centers for Disease Control &
Prevention, 2007). This figure amounts to less than 2 bills per state per year for that time period. The Washington state legislature introduced 41 bills on alcoholic beverages in the year 2011 alone (Access Washington, 2011).

Finding “common ground” is of paramount concern if policy action is to occur. Results from the present study suggests that the common ground in the obesity arena is in perceived benefits of the measures, perceiving obesity as a serious societal problem, understanding that both personal and environmental factors contribute to obesity, and believing that the government should be proactive in lowering obesity levels. After controlling for political affiliation, these were the variables which best predicted support for obesity reduction measures.

It is noteworthy that two variables, political affiliation and preferred level of government involvement into obesity reduction issues, accounted for 49%, 56%, and 32% of the variance in support for public school measures, community-based measures, and taxation-related measures, respectively. Legislators who believed that government should be involved in legislating obesity reduction measures “seldom/never” were significantly less supportive than legislators who endorsed involvement “sometimes” and “always/often” after controlling for political affiliation. A Republican legislator who prefers government involvement “sometimes” could be more supportive of obesity reduction measures than a Democratic legislator who prefers government involvement “seldom/never”. There were 27 Republican legislators in the present study who believed involvement should exist “sometimes”. This distinction is important to understand so that Republican legislators are not dismissed summarily as non-supportive in the obesity policy debate.
For a politician, the word “tax” can be politically hazardous. The finding that taxation-related measures were the least supported types of policy was not surprising. What is surprising is that there has been much focus on the use of tax policy to decrease consumption of unhealthy food items, such as soda. Much has been written in the literature regarding the potential impact of so called “fat taxes”, particularly in the area of taxes on sugared beverages for obesity reduction, along with dialogue about where best to allocate the revenues generated from these measures (Brownell et al., 2009a; Brownell et al., 2010; Gortmaker et al., 2011). One factor that works in favor of implementation of taxation-related measures is the revenue that could be generated from such activities. Revenue generated from taxes on soda, candy, or fast food could be used to fund ancillary public health initiatives. However, as the present study demonstrated, taxation-related measures remain politically toxic and are therefore difficult for legislators to support. Among the hypothetical measures presented to the legislators in this study, the most supported measure was “imposing a nominal fee on sugared beverages”. This may be due, in part, because taxes on sugared beverages represent an incremental increase in existing policy for some legislators or that taxing sugared beverages has been on the political radar longer than “imposing a nominal fee on unhealthy fast food items”.

Interestingly, perceived barriers were not a good predictor of legislator support for obesity reduction measures while perceived benefits were. Perceived benefits accounted for 3% of the variation in support for public school and community-based measures, but was not a significant predictor of taxation-related measures. Overall, state legislators perceived many benefits to the 17 potential obesity reduction measures. Almost 4 out of 5 of the legislators surveyed (78%) selected “Improved health” as a benefit of passing the
measures. The most common barrier selected was “not the role of government”. This item was endorsed mainly by Republican ($n = 106$ of $117$) legislators, but also by many Democratic legislators ($n = 53$ of $120$). The barrier “special interest opposition” was the least selected option. Almost two-thirds (65%) of the legislators found at least one benefit of passing the hypothetical obesity reduction measures. Legislators also provided several of their own benefits and barriers to passing the hypothetical obesity reduction measures. The perceived benefits and barriers offered by the legislator were as follows:

**Perceived Benefits**

“Help give a healthy choice.”
“Improve employment opportunities.”
“Improved self-image.”
“Improved social support for obesity reduction.”
“Increased economic activity.”
“Reduce adult onset of diabetes.”
“Reduce health insurance costs to businesses & individuals.”
“Reduced health care costs for society.”
“Reduced state municipal costs.”
“Self-esteem.”

**Perceived Barriers**

“Costs to state gov.”
“Freedom of choice.”
“Home environment.”
“If healthy foods were more affordable.”
“Ineffective.”
“Ineffectiveness.”
“Lack of followup at home - people won't change their habits at home.”
“Local control.”
“Need to study implications more closely.”
“Negative impact on businesses in this economy/increased bureaucracy.”
“None address lifestyle w/exception of #13.”
“Not effective.”
“Not enough emphasis on education-physical ed and accountability.”
“Not enough information.”
“People still choose unhealthy option.”
“Problems defining „nutritional value”, „sugared beverages”, etc.”
“Special interest opposition would be significant”
“Unlikely to have impact.”
The limited support for the hypothetical obesity reduction measures shown by Republicans in general should be qualified. It may be that there were potential obesity interventions not included on the questionnaire that both Democrats and Republicans would have favored. However, the 17 hypothetical measures that were included on the current questionnaire were gleaned from the literature and reviewed by content experts at the Centers for Disease Control and Prevention. The existence of additional measures that both Republican and Democratic state legislators would support is possible, but such measures would need to be implemented, reviewed and endorsed by experts in the field before being considered evidence-based options.

5.6 Implications

Government has been called the most important actor in the obesity debate because governments are charged with protecting and promoting public goods, such as the public’s health (Gortmaker et al., 2011). The present study found that political affiliation was the strongest predictor for all three types of obesity reduction measures with Democrats more supportive than Republicans, in general. There may be a disconnect for Republicans between what they believe would work for obesity reduction interventions and what they are willing to support because of their political ideology. It is also possible that Republican (or Democratic) legislators do not fully appreciate the obesity epidemic or do not know the extent to which this issue affects their constituents. This has important implications for anyone advocating for the implementation of obesity reduction policies to an unsupportive state representative. Convincing an unsupportive state legislator of the potential utility of obesity reduction measures is essential if
meaningful policies are to be created and enacted. Understanding how legislators go about making decisions may prove useful in this regard. Some political scientists, such as Charles Linblom (1964) believe that legislators employ the Incremental Theory of decision-making which consists of the following five concepts:

1. The selection of goals and objectives simultaneously with an analysis of how to reach those goals and objectives.
2. Consideration of the potential alternatives for tackling the problem with special attention to politically benign alternatives (i.e. measures that only marginally change existing policies).
3. Consideration of important consequences, most notably economic impact.
4. Concluding that there are many potential solutions and that the best decision is based on compromise.
5. Whatever decision is made, it is focused on a current, concrete social defect.

Incremental Theory, if true, provides several insights into the decision-making processes of politicians as they grapple with complex social issues. This theory suggests public health advocates would be best served by focusing on obesity reduction measures that closely match existing policies or only slightly modify existing state policies. Large policy changes are less likely to be supported. If there are no state policies in effect, drafting new measures which attempt to change current and concrete social imperfections may be most viable. Measures that have limited costs, both politically to legislators and monetarily to constituents, are the most likely policies to be advanced.
Evidence for this phenomenon (and an argument for Incremental Theory) exists in the data from the present study. Public school and community-based measures that made the least amount of change to existing policy were more likely to be supported than measures that called for drastic change. For example, the hypothetical measures “increasing the availability of health foods/beverages in public schools”, “requiring yearly K-12 physical education in public schools”, and “prohibiting unhealthy vending machine foods in public schools” were more supported than “instituting smaller portion sizes in public schools.” According to the most recent “Trust for America’s Health” report from the Robert Wood Johnson Foundation (Levi, Vinter, Lauret, & Segal, 2011), some 20 states already have nutritional standards for school meals and competitive foods (vending machine items) while all 50 states have some form of physical education requirement. A public health advocate may be more successful by promoting incremental changes to these existing policies as opposed to lobbying for creation of newer, more expansive policies such as smaller portion sizes in public schools (which may itself prove difficult or impossible to monitor). The next section details additional suggestions for public health advocates when interacting with state legislators.

5.7 Recommendations for Public Health Advocates

Public health professionals should contact their state representatives to inquire about pending obesity reduction legislation. Prior to doing so, advocates can determine their representative’s political affiliation and gender (usually available on the internet or by calling the state capitol). If the representative is a non-White, female Democrat, they are more likely to commiserate with public health endeavors like population obesity
reduction. A backup to that demographically characterized legislator would be a Democrat of any gender. Additional questions to ask that will elucidate a legislator’s stance on obesity are “Do you perceive obesity to be a very serious or somewhat serious societal problem” and “Should obesity reduction measures focus on personal factors, environmental factors, or both?” Results from the present study suggest that if the legislator perceives obesity to be a very serious societal problem and feels that reduction efforts should focus on both personal and environmental factors, support for obesity reduction legislation is strong. These two questions can also provide information when deciding which candidate to vote for in legislator elections. Voting into office legislators who believe obesity is a serious societal issue requiring both personal and environmental changes to solve the problem may lead to more obesity prevention bills being drafted, introduced, and passed by state legislatures.

In the present study, legislative aides \((n = 40)\) were found to be less supportive of public school measures. Public health advocates, whenever possible, should take the time to communicate with the actual legislator. While it has been shown that the views of legislative aides are reasonably representative of the actual legislator (Welsh, 1993), speaking directly with the person who has the power to create laws is advised. It is important to consider the monumentally difficult task legislators face in solving social problems and that they have to consider all the ramifications of their actions to both their constituents and political allies. The true costs, both economic and political, of legislator actions may be difficult to grasp for someone outside the political arena.

Legislators are often uncertain of the potential consequences that may occur as a result of their policy actions which may lead them to entertain only small changes to
existing policies (i.e. incrementalism; see “Implications” section). Therefore, an informed advocate well-versed in the language of political science stands a better chance of being successful. Knowing the various types of obesity reduction measures other states have enacted and being able to detail the impact those measures had could help public health advocates in this regard. Legislators may be more responsive to advocates who are knowledgeable about all the various policy options, can describe the policy steps other states have taken to reduce population obesity levels, and can hypothesize about the intended and unintended consequences of the measures to be enacted.

Public health advocates should carefully consider the differences between Democrats and Republicans described in the present study. When writing a letter, calling, or personally visiting a Republican state legislator, advocates should present data elucidating the severity of obesity in the state, explain the problem in financial terms (i.e. obesity-attributable Medicaid expenditures), identify existing state policies surrounding obesity prevention, and advocate for incremental changes in existing obesity prevention policy. Tactics to employ for Democratic legislators may include identification of existing policies to be incrementally altered, formulation of a budget that includes how the policy will be paid for and by whom, examination of enforcement issues for the altered policy, and identification of fellow legislators who may be willing to co-sponsor an obesity prevention bill with the representative.

5.8 Future Research

State legislators have the power to create laws that govern the people living within their state. More research is needed on this population to better understand their
perceptions of the obesity problem and to study what solutions legislators believe are viable and justified. The role of the legislative aide in terms of gatekeeper to state legislators also needs to be explored. Do legislative aids differ in their perceptions of obesity and, if so, how does that affect their willingness to cooperate with academics? Additional research questions to ask include the following:

1. Do response rates on surveys of state legislators vary by time of year (i.e. pre versus post-election)?
2. What incentive other than money can be used to increase legislator response rates?
3. What other obesity reduction measures do state legislators consider viable?
4. Does stated support for a measure translate into actually voting for the measure?

Additional research is needed to better understand how the “other” political parties (Libertarian, Independent, Tea Party, etc.) view the obesity epidemic and what solutions they perceive to be viable. Also, research that utilizes a decision-making theory, such as Rational-Comprehensive Theory, Incremental Theory, or Mixed Scanning in conjunction with analysis of support for obesity reduction policies may have great utility. Academicians interested in pursuing this research should consider that a mailed survey study is time consuming, costly (see Appendix L – Budget for the Study), and may not deliver a strong response rate for the state legislator population. Conducting in-person interviews at state capitols may prove to be the best method for maximizing response rates but may be less advantageous in terms of expenses, depending upon the scope of the study (i.e. national vs. regional). Researchers should also consider the
results of the present study prior to hypotheses formation paying particular attention to inclusion/exclusion of variables that were not predictive of legislator support for obesity reduction measures (BMI, geography, etc). Limited space on questionnaires requires researchers to be as parsimonious as possible. Lastly, understanding what types of non-monetary incentives can be employed to improve response rates of mailed surveys (i.e. providing a copy of the results, “friending” the legislator on Facebook, etc.) could help inform academicians interested in conducting this type of survey research and greatly aid the external validity of any significant findings. Individuals who are interested in surveying state legislators by mail should pay particular attention to the caveats presented in section 5.3 above. In particular, it is suggested that the survey be sent at the beginning of the calendar year (i.e. January) to help ensure state legislatures are in session. Doing so increases the chance the legislator is present in their office to personally receive the questionnaire. Questionnaires in the present study were delivered during the summer months (May, June, and July) which may have partially hampered the response rate.

5.9 Conclusion

The obesity epidemic is a complex problem that requires a complex solution. The 17 hypothetical obesity reduction measures presented in the current study, while certainly not an exhaustive list, are evidence-based policies and represent best practice options for state legislators to consider. Implementing one or two of the measures would likely have minimal impact. Several of the measures would need to be enacted concurrently and implemented within schools and communities in a given state to have a substantial
impact on population obesity levels. These comments from three of the state legislators surveyed cement this point:

“Each of these proposals would be effective in a way but without most of them and our cultural denial, getting real change is extremely difficult.”

“No single method will have an impact. We need multiple strategies to have the major impact we need.”

“None of the "8-24" items in itself could have a major effect despite my individual answers.”

Public health educators can advocate for the health of all Americans by contacting their state representative and urging him or her to draft legislation that erodes the toxic, obesity-promoting environment that exists in the United States. Successful advocacy hinges on understanding the causes of obesity, appreciating the complex task legislators face in dealing with complex social issues, and being able to describe policies other states have attempted with knowledge of the impact of those measures.

5.10 Summary

This chapter provided a brief overview of the major findings of the study and placed the most salient outcomes into the context of the current literature and political climate. A summary of the entire study was followed by lists of both the rejected and accepted hypotheses. This was followed by a brief qualitative analysis of the potential reasons behind the low response rate that was obtained in the present study. The main discussion section examined the major study findings within the current political climate and detailed the steps that could be taken to reduce population obesity levels. Study
implications were provided which were followed by recommendations for anyone interested in advocating for obesity reduction measures. Future research options were suggested next followed by concluding thoughts and the Chapter 5 summary.
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Appendix A

Human Subjects Approval Letter
To: Joseph Dake, Ph.D. and Phillip Welch  
Department of Health & Recreation Professions

From: Mary Ellen Edwards, Ph.D., Chair  
Kamala London, Ph.D., Vice Chair  
Walter Edinger, Ph.D., Chair Designee

Signed:  
Date: 04/12/11

Subject: IRB #107368  
Title: State Legislators' Support for Evidence-Based Obesity Reduction Measures

On 04/07/11, the above research was reviewed by the Chair Designee of the University of Toledo (UT) Social Behavioral & Educational Institutional Review Board (IRB). Modifications were requested and approved by the Vice Chair under Exempt (categories 2b and 3) on 4/12/11. The requirement to obtain a signed consent/authorization for use and disclosure of protected health information form has been waived as this research is determined to be minimal risk and a signed consent/authorization document would be the only record linking the subject to the data. It was determined that this waiver for signed consent/authorization will not adversely affect the rights and welfare of the participants. This action will be reported to the committee at its next scheduled meeting.

Please Note: A consent form is not required for this study. However an Information Sheet regarding the study should be distributed to potential participants. This Information Sheet should include the name and telephone number of a contact person in case the subjects need additional information. It is also strongly encouraged that the study be explained verbally to potential subjects.

Items Reviewed:
- IRB Application Requesting Exempt Review
- Survey(s)

Designated as EXEMPT RESEARCH on: 04/12/11

Please read the following attachment detailing Principal Investigator responsibilities.
Appendix B

Survey Instrument
State Legislators’ Perceptions of Obesity Reduction Measures

1. Are you a **State Legislator**? Yes □ No, I am a **staff member** (please check one answer)

   **Note:** If you are a legislator, please continue on to question 2. If you are a staff member, please answer the remainder of the survey on behalf of the legislator

2. In your opinion, how serious of a societal problem is **obesity**? (please check one answer)
   □ Very serious □ Somewhat serious □ Not very serious □ Not serious at all

3. On which factors do you think interventions should focus to reduce the rate of obesity in your state? (please check one answer)
   □ PERSONAL FACTORS such as overeating, lack of exercise, watching too much television, etc.
   □ ENVIRONMENTAL FACTORS lack of safe places to be active, easy access to junk food, lack of access to fresh produce, etc.
   □ BOTH

4. Thinking about the previous 10 years, which of the following statements do you believe to be most true? (please check one answer)
   □ There has been more concern among my constituents about the rate of obesity in my state
   □ There has been about the same concern among my constituents about the rate of obesity in my state
   □ There has been less concern among my constituents about the rate of obesity in my state

5. Government should be involved in legislating obesity prevention efforts: (please check one answer)
   □ Always
   □ Often
   □ Sometimes
   □ Seldom
   □ Never

6. How familiar are you with the causes of obesity? (please check one answer)
   □ Very familiar
   □ Somewhat familiar
   □ Not very familiar

7. How familiar are you with the health consequences of obesity? (please check one answer)
   □ Very familiar
   □ Somewhat familiar
   □ Not very familiar
Instructions:
Given current fiscal and policy realities, please specify (a) how likely you would be to vote for each measure below and (b) how much of an impact on reducing obesity each measure could have in your state if enacted.

8. A measure increasing the availability of healthy foods and beverages in public schools
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

9. A measure decreasing availability of unhealthy foods and beverages in public schools
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

10. A measure making healthier foods and beverages in public schools more affordable
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

11. A measure prohibiting unhealthy vending machine foods and beverages in public schools
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

12. A measure instituting smaller portion sizes in public school lunches
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

13. A measure requiring yearly K-12 physical education in public schools
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

14. A measure providing tax incentives to grocery stores to locate in low-income areas
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

15. A measure providing incentives to existing food retailers in low-income areas to offer healthier foods and beverages
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact

16. A measure enhancing infrastructure that improves personal safety in areas where people are or could be physically active in underserved areas
   a. Likelihood of voting for the above (check one)  □ Likely  □ Possibly  □ Unlikely
   b. Impact on reducing obesity if enacted (check one) □ Major impact □ Minor impact □ No impact
17. A measure enhancing infrastructure that supports bicycling/walking for commuting and/or
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

18. A measure providing tax incentives for private sector advertising of healthier foods and beverages
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

19. A measure prohibiting fast food restaurants from including toys with unhealthy kids meals
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

20. A measure requiring chain restaurants to list the calorie content of food items on menus
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

21. A measure requiring food retailers to delineate healthier food items from unhealthy food items via a labeling system
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

22. A measure imposing a nominal fee on sugared beverages (i.e. non-diet soda, less than 100% fruit juice)
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

23. A measure imposing a nominal fee on unhealthy fast food items
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

24. A measure imposing a nominal fee on foods of limited nutritional value (candy, gum, etc.)
   a. Likelihood of voting for the above (check one) [ ] Likely [ ] Possibly [ ] Unlikely
   b. Impact on reducing obesity if enacted (check one) [ ] Major impact [ ] Minor impact [ ] No impact

25. How do you think the voters within your district would view the obesity reduction measures presented in survey items #8 – 24? (please check one)
   [ ] The majority would support almost all the measures
   [ ] The majority would support most of the measures
   [ ] The majority would support some (but not most) of the measures
   [ ] The majority would support few or none of the measures
26. Thinking only about those obesity reduction measures above that you DID support, please place an X next to all the potential benefit(s) you see to passing those measures (check all that apply)

- Reduced obesity levels
- Reduced state Medicaid expenditures
- Reduced absenteeism
- Improved health
- Improved quality of life
- Improved employee productivity
- Other

27. Thinking only about those obesity reduction measures above that you DID NOT support, please place an X next to all the factors that may prevent you from supporting those measures (check all that apply)

- I supported all measures
- Difficulty of implementation
- Not the role of government
- Personal beliefs
- Monetary costs to constituents
- Special interest opposition
- Constituent opposition
- Other

DEMOGRAPHIC INFORMATION

Instructions: Please place an X next to the option that best represents the legislator’s personal characteristics.

1. What is your race/ethnicity? (please check one or more)
   - African American
   - Asian
   - White
   - Hispanic
   - Other (please identify)

2. What is your level of education?
   - High school diploma
   - GED
   - Some college
   - Associate’s
   - Bachelor’s
   - Masters
   - PhD
   - JD
   - MD
   - Other (please identify)

3. Do you have a job other than State Legislator? (please check one)
   - Yes
   - No

4. Do you or a family member suffer from an obesity – related medical condition? (please check one)
   - Yes
   - No
   - Unsure

5. What is your height? ___ ft ___ in

6. What is your weight? ___ lbs

7. Do you have any other comments regarding this survey?

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Please return this survey in the postage paid envelope provided. Thank you for your time.
Appendix C

Expert Review Panel
Obesity Policy
Liz Schwarte, MPH
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**Former Legislative Aid**
Scott Smith
Chief Development Officer
St John Health Foundation
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**Former State Legislator**
Virg Bernero
Mayor
9th Floor City Hall
124 W. Michigan Ave.
Lansing, MI 48933
Appendix D

Cover Letter: Test/Retest
Dear ,

I am a doctoral student at the University of Toledo working on my dissertation titled "State Legislators' Perceptions of Obesity Reduction Measures". The goal of my study is to better understand how State Legislators think about obesity reduction policies. One requirement for my dissertation is to assess the reliability of my dissertation questionnaire. This assessment entails the questionnaire being completed twice by a small sample of State Legislators. I am asking for 10-15 minutes of your time (or a staff member’s time) to fill out my brief, four page questionnaire on two separate occasions.

Your responses on the questionnaire will be used to test the reliability of the instrument and will NOT be seen by anyone other than myself. Your name will ONLY be used to match the first survey to the second survey. Upon completion of reliability testing, I will permanently delete your survey data from my database. In return for your time, I would like to send you an executive summary of the main findings once my separate national study of State Legislators has been completed.

Please email me if you are able to help me in this regard. I will send you a copy of the questionnaire via email which you can complete and fax back to me or send electronically. I will send you the exact same questionnaire to complete again one week after I receive your first completed survey. If you have questions, please call me at 419-530-8591.

Thank you for your time.

Phil Welch, MA
Doctoral Candidate
University of Toledo
Appendix E

Email Notification: Wave One
Dear Honorable State Legislator:

You are among 800 state legislators across the U.S. who has been randomly selected to participate in a national study of perceptions of obesity prevention legislation. This research is being conducted at the University of Toledo. If you have not yet received this survey, you should be receiving a copy of the questionnaire via U.S. mail in a few days.

Your responses to the survey are strictly confidential and only group data will be analyzed. Your prompt response to this survey is greatly appreciated. Upon study completion, the researchers will email you a summary of the results of this national study.

Thank you for your time.

Phil Welch  
Doctoral Research Assistant  
University of Toledo
Appendix F

Cover Letter: Wave One
Dear Honorable,

We request your participation in a national research study of state legislators’ perceptions of obesity reduction measures. The **purpose** of this study is to ascertain the perceptions of state legislators from all 50 states regarding obesity prevention measures. We ask for approximately **10 – 15 minutes** of your time to complete the enclosed questionnaire. Please **do not** write your name or any other information that could be used to personally identify you on the survey form. All responses are **strictly confidential** and only group answers will be analyzed.

If you choose to participate, **you will receive** an executive report summarizing how your fellow legislators perceive obesity prevention issues. Your refusal to participate in this study will involve no penalty or loss of benefits to which you are otherwise entitled and will not affect your relationship with the University of Toledo.

If you have any questions before, during, or after your participation in this study, please contact the Principal Investigator, Dr. Joseph Dake at (419) 530-2743. If you have questions beyond those answered by Dr. Dake, or questions about your rights as a research subject or research-related injuries, please feel free to contact Dr. Jeffrey Busch, SBE IRB coordinator at (419) 530-2844.

We have included a self-addressed, stamped envelope for your convenience. Your response within the next week would be greatly appreciated. Thank you for your time and professional courtesy.

Sincerely,

Marlene Welch, MD, PhD
Assistant Professor
College of Medicine
University of Toledo

Joseph Dake, PhD
Department Chair
Health & Recreation Professions
University of Toledo

Phil Welch, MA
Doctoral Candidate
Health Education
University of Toledo
Appendix G

Cover Letter: Wave Two
Dear Honorable,

Recently, we mailed you a survey regarding state legislators’ perceptions of obesity prevention measures. If you already returned the survey, thank you very much.

If you did not return the original survey, it is not too late to participate in this national study. We are enclosing another copy of the survey and a self-addressed, stamped envelope. Please complete and return the survey at your earliest convenience.

We would like to remind you that responses are strictly confidential and only group data will be analyzed and reported. We will send you an executive summary of the research findings if you choose to participate. It is important that we hear from legislators on both sides of this issue.

The 10 – 15 minutes it will take you to complete the survey is greatly appreciated. This doctoral dissertation study is entirely self-funded. No political groups have contributed funds to the completion of this academic study.

Thank you for your time and participation in this national study of state legislators.

Sincerely,

Marlene Welch, MD, PhD
Assistant Professor
College of Medicine
University of Toledo

Joseph Dake, PhD
Department Chair
Health Education
University of Toledo

Phil Welch, MA
Doctoral Candidate
Health Education
University of Toledo
Appendix H

Cover Letter: Wave Three
Dear Honorable,

This letter is a follow-up request for your participation in our national study of state legislators. As you may be aware, obesity adversely affects millions of Americans. It is a major contributor to disease, disability, and state Medicaid costs. Obesity is a complex public health threat that requires input from and collaboration between policy makers, health care providers, and the general public if workable solutions are to be realized.

Please assist us with this national study by completing the enclosed survey, if you have not already done so, and return it to us in the self-addressed, stamped envelope. Your input will help guide public health advocacy efforts toward the most politically feasible solutions to the obesity epidemic.

The 10 – 15 minutes it will take you to complete the survey is greatly appreciated. If you cannot complete the survey personally, we invite participation from a legislative aide on your behalf.

Responses are strictly confidential and only group data will be analyzed and reported. This doctoral dissertation study is entirely self-funded. No political groups have contributed funds to the completion of this academic study.

Thank you for your time and participation.

Sincerely,

Marlene Welch, MD, PhD
Assistant Professor
College of Medicine
University of Toledo

Joseph Dake, PhD
Department Chair
Health Education
University of Toledo

Phil Welch, MA
Doctoral Candidate
Health Education
University of Toledo
Appendix I

Email: Wave Four
Dear Honorable State Legislator,

We recently sent you a survey titled "State Legislators' Perceptions of Obesity Reduction Measures". If you already completed and mailed the survey back, thank you. If you have not yet replied, please consider providing your input into our study of state legislators by completing the attached survey and either emailing back to philip.welch@rockets.utoledo.edu or faxing to 419-530-4759. If you do not wish to participate, please respond to this email and let us know why.

We have heard from many legislators around the country but need a few more completed surveys to conclude our study. Your participation is critically important and greatly appreciated. If you do not have time, legislative aides are encouraged to participate. All responses are strictly confidential and will only be analyzed in aggregate form. If you have additional questions prior to responding, please contact Dr. Joseph Dake at 419-530-2743.

Thank you for your time.

Philip Welch, MA  
Doctoral Candidate  
University of Toledo

Joseph Dake, PhD  
Associate Professor  
University of Toledo

Marlene Welch, MD, PhD  
Assistant Professor  
University of Toledo
Appendix J

Phone Script: Wave Five
Hello, my name is Phil Welch. I am a doctoral student from the University of Toledo.

I’m studying state legislators as part of my doctoral dissertation. I sent your office a survey a few weeks ago and was just wondering if you happen to know if Representative ______ has sent it back yet? If not, would it be okay if I fax or email the survey to your office again?
Appendix K

“Other” Comments From Legislators
**Democrat comments**

-A good survey, and great question. I hope we can help with this project.

-As stated, the limited options offered deal with external factors. The roots of obesity, especially within generational poverty, are deeper and complex. Treatments need to be equally comprehensive.

-Early childhood programs

-Good luck. We have no tobacco vending machines now and having healthier foods and beverages CHEAPER might be a great incentive

-Great survey. I realized I do not know as much about obesity and obesity prevention as I thought I did.

-Great survey. Please email me a clean copy to:

-Great survey. Sorry, but I do not believe it appropriate to say how I would vote before hearing various opinions & ideas

-Healthy food needs to be cheaper. Major impact.

-I don't think we can legislate weight any more than we can legislate morals!!

-I lost 90 lbs in 5 months a couple of years ago and have kept it off by calorie counting.

-Calories should be listed on all fast food; it is difficult to calorie count in fast food places.

-I work in the insurance business and see the effects of obesity daily I'm glad you are doing this survey and look forward to reading the results. My state (Idaho) is very anti telling people what to do thru legislation. Good luck! It's important.

-Insurance companies should also be considered in legislation both to provide surgery for the obese and differentiate insurance premiums according to weight.
-It's a tough proposition to have government tell us what we can eat. I should feel free to smoke pot and cigarettes too - understanding cigarettes kill. It's my business, my life.

-It's great to see scholars doing what is necessary to research the factors of obesity and develop or implement solutions

-Please send results. Should have incentives to expand physical activity (youth sports)

-Provide a followup to survey results

-Seems to be addressing food retailing but not manufacturing/processing and wholesaling. Maybe need a broader scope.

-Several questions don't apply well to rural states; many answers are opinions without benefit of more information

-Should have questions re: prohibition of certain product advertising. Coca Cola seeks to double revenues by 2020.

Sorry I may be too late

Why 5 & 6 - especially when both staff of a legislator could answer?

Why should the gov. take care of this?

You can lead a horse to water, but you can't make him drink!

You need to include an "education" component. We are talking about changing "habits" and "culture" - not easy!!

"Healthy" food must be defined - I oppose eliminating beef

*Republican comments*

-A "nominal fee" is a tax

-At 69 - being overweight is likely normal
-Behavior change is extremely difficult to legislate, including [unlegible] choice. Federal changes in the use of SNAP would have an impact on reducing obesity & receive support from the tax paying public.

-Did not read a question sitting

-Education not more gov.

-Education-and personal responsibility - incentives

-Feel good govt. intervention (e.g. safety); court activity (e.g. liability); 24/7 news (e.g. alarmist) have diminished free spirited activity of youth and I don't see more of the same as a solution. A step back is a step forward.

-Focus on more physical education in k-12 towards lifestyle and maintenance. Classes in yoga, personal weight training, cardio, etc. need to be taught in our public schools and high school especially. Personal health and physical training should be mandatory!

-Focus should be more on adjusting societal behavior patterns instead of limiting business choices and taxing consumer preferences

-Good nutrition is taught at home and modeled at home. Yes food is a powerful maturateion and is use as a substitute for comfort in dep functional families. None of the basic underlying causes of obesity have been address-your questionnaire wishes this issue

-Government needs to inform us about obesity but not regulate what we eat or think

-Government needs to stay out of peoples lives

-Government should stop subsidizing negavit factors, like corn (hFcs), but otherwise leave people free to live their lives - including responsibility fo their own medical care

-Govt. needs quite dictating to people.
-I answered item #20 in the negative because health should be enforced globally rather than microscopically. Including precise calorie counts on menus eliminates pleasurable dining & could allow the pendulum to swing towards anorexia for some.

-I do NOT support legislation that restricts freedoms of choice

-I do own fitness centers

-I don't like tax incentives or mandates. If we removed soft drinks from vending machines, how will we control the environmental when they leave school to go home.

-I have sugar and put myself on 4 carbs a meal and watch sugars closely. People can see "0" sugar but miss sugar by alcohol. Education.

-I would appreciate a copy of the final result.

-I would not support any measure that would intrude on private business. It is not the government's role to tell private business what to sell.

-I would rather discuss more radical reforms of food stamps to limit access/payment for unhealthy foods.

-It is not possible to legislate personal responsibility

-It is not the role of government to regulate society. Thank you.

-Just because a problem exists that does not create an imperative for a government solution.

-Legislating behavior is NOT the role of government. These are personal decisions best left to families.

-Legislator does not believe government should be intrusive on businesses or take away the rights of business owners
- Obesity has the best chance of being controlled by the use of education through our schools systems and media services privy to young people.

- Obesity is more about personal responsibility

- Obesity/health care is a major issue for our society. Will get push back if government mandates food consumption. Education will drive the changes needed.

- People need to take personal responsibility. Not the role of government

- People need to walk and be responsible for their own actions - its not the governments job to do it for them. There is no limit to the number of laws that can be passed to do good things - which can be more oppressive than some bad legislation

- Personal responsibility should have been addressed in this survey. Health and physical education curriculums need to address the obesity issue at all grade levels!

- Rather slanted survey!

- Social engineering from state or federal government has never worked, and never will!

- The biggest factor which affects obesity is personal choice. It is not the role of government to dictate how people live. You cannot and should not legislate personal decision making in this fashion.

- The survey appears to assume that any legislative measures, short of totalitarian food policy, will make a change. The only change to make a difference will have to be cultural.

- This is among many of the US societal problems. It is time our media get with the program & start conveying old fashioned ideals making homemade meals being one of them. Sexual behaviors etc. - create an attitude of it feels good dot it; if it tastes good, eat
it. Much of this starts at home. Parents need to get a clue & start being active with their children's diet & exercise.

-This is an area government should stay out of. Regulating fat people is not the government's job.

-Try to educate the people with facts. Increase insurance costs if obese. Keep government out of personal life.

-We don't need the govt to be the fat police. This is not the job of the government. Eating & exercise are personal choices. If you choose to overeat, eat the wrong foods & refrain from exercise - you should have to pay more for your health insurance. If you are on a govt plan, you should be surcharged over and above what others pay for co-pays etc. if you are overweight.

-We have too damn much govt. regulation already

-Whatever happened to personal responsibility and training parents. Government has no place in this issue.

-Who is going to see the results?
Appendix L

Budget for the Study
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<th>Item</th>
<th>Cost ($)</th>
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<td><strong>Wave I</strong></td>
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<tr>
<td>Stamps (outgoing and return, n = 1600)</td>
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<tr>
<td>Questionnaires (n = 800)</td>
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<td>Labor</td>
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<tr>
<td><strong>Wave II</strong></td>
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**TOTAL** $4,296.50