WHAT DO PARENTS SAY ABOUT CHILDHOOD OBESITY? THE DEVELOPMENT AND VALIDATION OF A SURVEY INSTRUMENT TO MEASURE PARENT'S PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

by

EMILY MARIE JONES

(Under the Direction of Paul G. Schempp)

ABSTRACT

The purpose of this study was to develop a survey instrument to measure parental perspectives of a) childhood obesity locus of control and b) solutions to childhood obesity. Such a measure could facilitate the design and development of childhood obesity related programs based upon the perspectives and values of parents, vital stakeholders in the lives and health of children. This study utilized a reiterative instrument development model proposed by Benson and Clark (1982) that involved a series of five pilot tests that provided initial qualitative and quantitative evidence of the reliability and validity of the instrument. A sample of 622 adults (75% 31-50 years; 90% parents) in the state of Georgia, United States, completed working versions of the newly developed instrument to assist in the establishment of content relevance, item clarity, and initial estimates of instrument reliability. The final questionnaire included 17 potential childhood obesity locus of control items that were placed on a five-point Likert scale ranging from strongly disagree, disagree, neutral, agree, strongly agree. The instrument also included 40 possible

childhood obesity prevention strategies dually categorized by CDC *Healthy People 2010* focus areas (CDC, 2000) and Social Ecological Model (Brofenbrenner, 1979) social levels. Respondents rank ordered groupings of the potential solutions in preference of support. Demographic information about the respondents' age, sex, marital status, educational attainment, and parental status was collected. Instrument completion time was estimated to be 10 minutes. Exploratory factor analysis of these data revealed four childhood obesity locus of control factors (Internality, Chance-Externality, Powerful Others Outside the Home, and Powerful Others Inside the Home). These factors accounted for 46% of the total variance explained and held moderately strong alpha coefficients (range, .654 - .718). Descriptive statistics (*M, SD,* and mode) facilitated the analysis of rank order data of the solutions to obesity. Initial findings highlight participant propensity to support content specific prevention strategies implemented within stratified social levels. The result of this study is a newly developed instrument that measures perceptions of childhood obesity locus of control and solutions to childhood obesity.

INDEX WORDS: childhood obesity, children, adolescents, instrument development, interventions, locus of control and obesity prevention.

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DEDICATION

I give praise to my Heavenly Father, for without His goodness and sacrifice I would be nothing. Throughout this process, I have been reminded of His greatness and have been challenged to trust in His never failing plan.

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CHAPTER 1

INTRODUCTION

In 1996, the Surgeon General issued a landmark report that was the first to address physical activity and health of Americans (United States Department of Health and Human Services [USDHHS], 1996). The primary message of the report described the health benefits of physical activity and further defined the trend of sedentary lifestyle and adverse effects of inactivity (USDHHS, 1996). In this flagship report, data from nationwide youth surveillance studies such as the National Health Interview Study (NHIS) (Center for Disease Control and Prevention [CDC], 1993; NCHS, 1994), the Youth Risk Behavior Survey (YRBS) (Kolbe, 1990; Kolbe, Kann, & Collins, 1993), and the Behavioral Risk Factor Surveillance System (BFRSS) (CDC, 1992) revealed a growing trend of decreasing physical activity of young people (USDHHS, 1996). High prevalence of sedentary behaviors and growing inactivity trends in children and adolescents ignited investigations of potential health effects of these behaviors (Strong et al., 2005). Studies in adult populations had previously identified sedentary patterns correlated to increased risk of developing chronic diseases such as coronary heart disease and Type 2 diabetes (Morris, Heady, Raffle, Roberts, & Parks, 1953). Findings such as these spurred researchers to consider reciprocal effects of inactivity in children and adolescents.

In 2000, a report published by the World Health Organization (WHO) underscored this global concern for the prevalence of obesity in children and adolescents. The report titled *Obesity: Preventing and Managing the Global Epidemic* established that obesity rates in developed and developing countries were rising at alarming rates, in both adults and children (WHO, 2000). Additionally, evidence was put forth that identified the Americas (North and South America) reporting the greatest prevalence of overweight and obese adults (WHO, 2000)

and in 2006, the same trend was declared in children and adolescent populations (Wang & Lobstein, 2006). Wang and Lobstein (2006) asserted that in the Americas, 27.7 million children were overweight, and of those, nearly 9.6 million were obese. Further, based on current epidemiological trends of obesity in children, Kosti and Panagiotakos (2006) projected that by the year 2010 the proportion of school-age children in the Americas affected by obesity will double. In the United States, Ebbeling, Pawlak, and Ludwig (2002) examined thirty-years (1971 to 1999) of obesity prevalence in children. Their findings concurred with global data to reveal two and three-fold increases of obesity in adolescents (aged 12-19 years) and children (aged 6-11 years). In 2003-2004 the prevalence rates of overweight children was an estimated 17.1% (males 18.2%; females 16.0%) (Ogden et al., 2006) and supported by data from the 2003 National Survey of Children's Health study with their findings of 14.8% of young people aged 10-17 years (males 18.1%; females 11.5%) as overweight (USDHHS, 2005).

The economic burden obesity has had on the U.S. economy has accounted for 5.5-7.0% of the national health expenditures (Thompson & Wolf, 2001), which according to Caterson, Franklin, and Colditz (2004) is the greatest amount per capita spent on obesity related costs. In 1995, the direct and indirect costs related to obesity in the U.S. totaled US$51.6 billion and US$47.6 billion (Wolf & Colditz, 1998). These estimates represented roughly 5.7% of health care costs during that fiscal year (Wolf & Colditz, 1998). Another report, offered that in 1995 direct costs alone totaled US$70 billion, representative of 7% of health care costs (Colditz, 1999). Specific to childhood obesity, the economic burden of obese children and adolescents (ages 6-17 years old) analyzed by Wang and Dietz (2002) revealed threefold increases in obesity-related hospital costs from $35 million during 1979-1981 to $127 million during 1997-1999.

In addition to exploration of the prevalence of childhood obesity, scholars have claimed the detrimental health outcomes and co-morbidities of the disease in children are similar to those linked to adult obesity (Daniels et al., 2005; Paradis et al., 2004; Weiss et al., 2004). The 2000 WHO report identified the prevalence and effects of obesity in both developed and developing countries was an "escalating global epidemic" (WHO, 2000). As a result of this increase in obesity subsequent studies have identified obesity-related health outcomes including enhanced prevalence of cardiovascular risk factors (Berenson et al., 1998; Freedman, Dietz, Srinivasan, & Berenson, 1999; Whincup et al., 2005), metabolic syndrome (de Ferranti et al., 2004; Gutin, Barbeau, & Yin, 2004; Weiss et al., 2004), asthma (Castro-Rodriguez, Holberg, Morgan, Wright, & Martinez, 2001), and psychological factors such as self-esteem (Strauss, 2000). The laundry list of adverse health issues compound a gloomy public health image of this young generation.

The recognized outcomes of obesity noted above have caused scholars to question the factors leading to obesity in children and adolescents. When looking at the etiology of obesity, it is defined as the accumulation of excess adiposity tissue (WHO, 1996), which is a result of an imbalance between energy intake and energy expenditure (Daniels et al., 2005) which underlies the undesirable positive energy balance and weight gain (WHO, 2000). Yet, various interacting factors have been noted as influencing this disease. For example, there appears to be a dynamic interrelation among "genetic, biological, psychological, socio-cultural, and environmental factors … [that] are evident in childhood obesity" (American Academy of Pediatrics, 2003, p. 425), which refutes a simple and direct diagnosis of the cause of childhood obesity (WHO, 2000). However, there is established evidence to suggest various risk factors of the genetic, biological, psychological, cultural and environmental nature interact and in turn increase the risk of developing overweight and obese symptoms.

The investigations of risk factors have identified three chief factors that are highly correlated with childhood obesity across populations and age groups. These factors include: a) nutrition, b) physical activity and c) sedentary behavior Berkey et al., 2000; Ekelund et al., 2005; Lowry, Wechsler, Galuska, Fulton, & Kann, 2002; Must & Tybor, 2005; Storey, Forshee, Weaver, & Sansalone, 2003; Vermorel et al., 2005). Each one is behavioral in nature, and therefore may be influenced or modified by environmental structures, social support, and personal decisions.

The interacting factors known to cause childhood obesity along with the significant health and financial burdens of the epidemic have emphasized the need for solutions to curb this public health problem. In 2003, the American Academy of Pediatrics [AAP] issued a policy statement aimed at widespread obesity prevention. Recommendations from the policy statement (AAP, 2003) recognized early identification of excessive weight gain as imperative to prevention of obesity along with enhanced advocacy efforts of healthy behaviors such as physical activity, proper nutrition, reduction of media use within multiple contexts or settings. Other nationally recognized organizations, such as the Center for Disease Control and Prevention, the Partnership for Prevention, the National Association of State Boards of Education, and the Institute of Medicine (Institute of Medicine, 2004; Partnership for Prevention, 2008; Wechsler, McKenna, Lee, Dietz, & National Association of State Boards of Education, 2004; Yee et al., 2006) have expressed concern over these adverse effects and have put forth their endorsements of prevention strategies. These national awareness initiatives have aided in the development of obesity prevention programs to reduce the impact and prevalence of childhood obesity.

To have this desired effect on childhood obesity, scholars have approached prevention with multifaceted strategies. For example, prevention programs embedded within schools,

communities, family, and medical settings range in outcome variables or factors addressed (i.e., increased physical activity, fruit or vegetable consumption or reduced media use) and also the degree of support garnered from additional agencies (i.e., community members, teachers, and parents) (Connelly et al., 2002; Small, Anderson, Mazurek, & Melnyk, 2007). Researchers in the area of obesity interventions have identified parents and caregivers as having an important role in the development of overweight and obesity in children (Etelson, Brand, Patrick, & Shirali, 2003; Golan & Crow, 2004; Pate, Trost, Mullis, Sallis, Wechsler, & Brown, 2000; Wofford, 2008) and therefore have begun to include parents and family-based interventions in their literature addressing notable strategies. Dietz and Gortmaker (2001), for example, posited that family practices such as food choice and behavior patterns directly affect a child's energy intake and energy expenditure. In recognition of this dynamic relationship, obesity prevention programs have targeted parent involvement in reducing their child's excessive caloric intake (Birch & Davison, 2001; Brownell & Kaye, 1982; Epstein et al., 2001; Muller, Asbeck, Mast, Langnase, & Grund, 2001); time spent watching television (Dietz & Gortmaker, 2001) and increasing physical activity behaviors (Epstein, Paluch, Gordy, & Dorn, 2000; Golan, Weizman, Apter, & Fainaru, 1998). Results from the aforementioned studies imply that the impact of parent involvement can be vital to program effectiveness.

While parental involvement in childhood obesity programs has been established as a crucial intervention element (Golan & Crow, 2004; Pate et al., 2000; Wofford, 2008) another recognized effective component is parental perceptions of childhood obesity. More specifically, parental support of specific obesity prevention and intervention tactics (Gable & Lutz, 2000; Haerens et al., 2006; Murphy, 2006; Myers & Vargas, 2000; Sherry et al., 2004). The research regarding parental perceptions of obesity has suggested that parents of obese children may not be

able to accurately identify obesity in their children (Etelson et al., 2003; Gray et al., 2007; Jansen & Brug, 2006; Myers & Vargas, 2000). Parents inaccurate perceptions of obesity in their children was noted by Myers and Vargas (2000) as a demonstration "that what parents think about their child's obesity may have a strong impact on the nutrition practices and exercise activities they implement with their child" (Discussion section, ¶ 4). The authors further defended the importance of parental perceptions as integral components of an obesity intervention process as they concluded, "intervention strategies [should be] geared toward recognition of the beliefs and understandings of parents" (Myers & Vargas, 2000, Discussion section, ¶ 4).

Noting the significance of understanding how parents acknowledge obesity and obesity prevention was expanded on by Hesketh, Grees, Salmon, and Williams in a qualitative study involving Australian parents and children (2005). Findings from this study suggested that parents perceived healthy eating to be a primary issue in childhood obesity and suggested increased availability and promotion of healthful food for children as a practical preventative strategy (Hesketh et al., 2005). Along these lines, the degree of parent perceptions and support for intervention tactics was also demonstrated in a 2006 school-based study. Haerens and colleagues (2006) found that parental support of the elements of an obesity intervention (i.e., physical activity and healthy eating) resulted in positive body mass index outcomes of middle school-aged participants when compared to a control group without parental support (Haerens et al., 2006). These findings suggest that parent's perceptions and their support of intervention tactics aimed to reduce childhood obesity are important to program effectiveness.

It would seem from the above conclusion, that capturing parental perceptions of specific tactics and strategies to reduce childhood obesity would be integral in the development of future

obesity prevention and intervention programs. Yet, to date, there have been no valid and reliable instruments developed to measure this. Therefore, the purpose of this study is to develop and provide preliminary evidence of validity and reliability of a survey instrument that will measure parent perception of solutions for childhood obesity.

Purpose of the Study

The purpose of this study is to develop and provide preliminary evidence of validity and reliability of a survey instrument that will measure parent perception of solutions for childhood obesity.

Limitations and Delimitations

Limitations

A limitation of this study is that the target group participants contributing to the development and validation will be selected with convenience sampling. The method of participant selection may produce biased or uneven distribution of participants by sex, ethnicity, geographic location, and others.

Another limitation of this study is that survey data cannot be entirely exhaustive as the constructs and content included within the survey instrument will be based on a review of literature of previously implemented strategies and the agreement of the designer, content experts, and target participants on specific strategies. However, it was attempted to incorporate a comprehensive list of potential solutions to childhood obesity to be included within this survey instrument.

Delimitations

One assumption is that individuals completing the questionnaire will answer honestly. A limitation is the distribution of questionnaires. Another assumption of this study is that a

paper/pencil or electronic questionnaire can satisfactorily measure how parents perceive and prioritize specific strategies to reduce childhood obesity.

Definition of Key Terms

Overweight. The international criterion for distinguishing overweight and obese status is based on body mass index (BMI) score, a calculation of height and weight. Age and sex specific cut-points for BMI classify overweight as ≥25 kg/m^2 (CDC, 2007).

Obese. The international criterion for distinguishing overweight and obese status is based on body mass index (BMI) score, a calculation of height and weight. Age and sex specific cut-points for BMI classify obese as ≥30 kg/m^2 (Centers for Disease Control and Prevention (CDC), 2007).

Obesity. The accumulation of excess adiposity tissue (World Health Organization, 1996).

Physical activity. Any bodily movement that results in energy expenditure (Casperson & Christenson, 1985).

Domain. Referring to the content area defined within a survey instrument (Benson & Clark, 1982)

Construct. "An unobservable, presupposed trait that a test developer may invoke to describe test behavior or criterion performance" (Allen & Yen, 1979, p. 173). Examples include ability, personality traits, interests, attitudes, and other physiological factors.

Reliability. "The consistency or repeatability of a measure" (Thomas & Nelson, 1994, p. 220). The evidence of reliability comes in various forms, some of which are discussed below.

Test-retest coefficient. A measure of reliability that takes into "account error variance produced by different times… [of instrument] administration" (Aiken, 1997, p. 155). This

coefficient is obtained through the test-retest method and provides evidence of stability of the items on the survey instrument.

Test-retest method. A measure of reliability that is "based on testing the same examinees twice with the same test and then correlating the results" (Allen & Yen, 1970, p. 76).

Internal Consistency. "The extent to which all questions or items on a psychometric instrument measure the same variable or construct" (Aiken, 1997, p. 282). This reliability measure will be calculated by the Cronbach-alpha.

Cronbach coefficient alpha. A measure of internal consistency that is calculated using the following formula $\alpha = k(1 - \Sigma s_i^2 / s_t^2) / (k - 1)$. Where: k = the number of items, s_i^2 = the variance of the total scores, Σs_i^2 = the sum of the individual item variances (Aiken, 1997, p, 156).

Item discrimination. "The difference in proportions of correct response between two extreme groups in the distribution of total test scores" (Ebel, 1967, p. 126).

Validity. The judgment regarding how well a test or other measurement tool measures what it purports to measure (Allen & Yen, 1979; Cohen & Swerdlik, 2002). Multiple sources of validity will be pursued throughout this study to provide preliminary evidence of instrument validity.

*Content Validity. "*The extent to which a group of people who are experts in the material with which a test or other psychometric instrument deals agree that the instrument measures what it was designed to measure" (Aiken, 1997, p. 280).

Construct Validity. "The extent to which scores on a psychometric instrument designed to measure a certain characteristic are related to measures of behavior in situations in which the characteristic is supposed to have a significant effect on behavior" (Aiken, 1997, p. 279).

CHAPTER 2

REVIEW OF RELATED LITERATURE

The purpose of this study is to develop and provide initial validation of a survey instrument that will measure parental perception(s) of potential solutions to childhood obesity. In order to address the necessary factors of this study a review of literature was executed to addresses the known components of childhood obesity as well as illuminate pre-existing efforts to curb childhood obesity. Furthermore, the subsequent sections of this chapter identify nationally coordinated approaches to combat childhood obesity, measurement theory, and conclude with the relevance of particular aspects of measurement theory that can measure potential solutions to childhood obesity. Strategies used to conduct this preliminary literature search included electronic searches of peer-reviewed journals (i.e., in these areas: physical education, education research, health behavior, public health, measurement, and health education), electronic access to governmental documents, review of reference lists and personal communication. Keywords used in this literature search were: obesity, children, adolescents, nutrition, measurement theory, instrument development, interventions, and obesity prevention.

The organization of this chapter will begin with a discussion of childhood obesity and its impact on the national and global scale. Following this, the causes and consequences of childhood obesity as established from empirically based studies will provide a foundation of what is known of the effects of obesity. Next, a discussion of the research that has elicited public opinion of obesity will be presented, as this concept provides a foundation for capturing parental perceptions of obesity and health behaviors of children and adolescents. The perspectives/opinions of parents regarding obesity have assisted in both the development of presentation strategies and sustainability of programs. Therefore, an examination of the

effectiveness of obesity prevention and intervention programs that have targeted children and adolescents will be provided. Finally, this chapter concludes with a description of current measures of parental perceptions of childhood obesity to illuminate the necessity of a new survey instrument to measure parental perceptions to solutions to childhood obesity.

Childhood Obesity

Childhood obesity in the United States has grown to epic proportions within the past three decades (Ogden et al., 2006). A review of literature pertaining to the components of childhood obesity will be presented and will discuss the prevalence (the overall extent) and incidence (within particular sub-groups) of obesity in children in the United States. Furthermore, this section will provide an overview of the recognized causes and consequences of childhood obesity.

The acknowledgement of obesity in children was decisively revealed to the public in the *1996 Report to the Surgeon General* (United States Department of Health and Human Services [USDHHS], 1996). This report described the declining physical activity and fitness of American's youth. The *Report of the Surgeon General* outlined the low physical activity participation levels of high school aged children (National Health Interview Survey of Youth Risk Behavior Survey [YRBSS] CDC, 1992) and the sedentary behaviors of nearly 25% of the adult U.S. population (Behavioral Risk Factor Survey CDC, 1992). Further, this report became the directive of subsequent population-based studies that produced a portrait of a vastly inactive and obese generation. One study that examined the extent of this trend and found two and three-fold increases of obesity in U.S. children aged 12-19 years and 6-11 years old between the years 1971 and 1999 (Ebbeling, Pawlak, & Ludwig, 2002). Furthermore, the 2003 National Survey of

Children's Health found 14.8% of children and adolescents (10-17 years old) were overweight (USDHHS, 2005).

From a global perspective, childhood obesity is not limited to the United States. The report titled *Obesity: Preventing and Managing the Global Epidemic* assessed the global prevalence of obesity, its health consequences, and its economic cost (WHO, 2000). In 2004, the International Obesity Task Force reported that of the 155 million overweight children, 30-40 million obese worldwide (Lobstein, Baur, & Uauy, 2004). Although Wang and Lobstein (2006) did identify the Americas as having the greatest prevalence of overweight and obese children at 27.7 million, 9.6 million of who were obese, Europe was in close second at 25.5 million overweight and 5.4 million obese and Eastern Mediterranean countries followed closely with 23.5 million overweight, 5.9 million obese (Wang & Lobstein, 2006). The expansiveness of obesity in children globally presented the need to identify and employ programs that are suitable for reducing the prevalence of childhood obesity.

In the United States, studies have identified greater prevalence of overweight and obesity in females (18.1% females; 11.5% males), particularly increasing as they age and greatest incidence rates in non-Caucasians (see Table 2.1) (Gordon-Larsen, Adair, & Popkins, 2003; USDHHS, 2005). Analysis of data collected through the 2003 population based study National Longitudinal Study of Adolescent Health (N=13,113) reported overweight prevalence in females was more evident when race and socioeconomic status (SES) varied (Gordon-Larsen et al., 2003). An inverse relationship between SES and race in Caucasian females but a positive relationship was identified between SES and race in African American females (Gordon-Larsen et al., 2003).

Table2.1

Incidence Rates of Overweight In 2003 NSCH (ages 10-17 years)

Sex	
Boys	18.1%
Girls	11.5%
Race	
Non-Hispanic Black	23.5%
Hispanic	18.9%
Multiracial	15.3%
Other	15.2%
Non-Hispanic White	12.0%

Note. From "The National Survey of Children's Health 2003" by United States Department of Health and Human Services, 2005

In summary, since the 1996 *Report to the Surgeon General* there has been extensive effort put forth to describe the prevalence and incidence of obesity in children both in the United States and worldwide. The longitudinal consequences of overweight and obesity in childhood has been speculated to have negative health outcomes in adulthood. Daniels et al., (2005) indicate that 80% of overweight adolescents will become obese adults. In longitudinal studies childhood obesity has been correlated to lesser quality of life and greater risk of developing coronary heart disease, insulin resistance, hypertension, and increased risk of mortality in adulthood (Lawlor & Leon, 2005). For these and other public health issues, childhood obesity has been termed an "escalating global epidemic" (WHO, 2000) and recognized as a pervasive crisis in need of solutions and preventative measures. This issue has demanded the attention of

scholars, clinicians and practitioners, who have worked to provide evidence of the causes and consequences of childhood obesity. Thus, a brief discussion of the known causes and consequences of obesity in children and adolescents will assist in offering direction to strategies necessary to reducing or alleviating this condition in young people.

Consequences of Childhood Obesity

As the prevalence rates of overweight and obesity continue to rise, so does the economic burden of the preventable condition (Thompson & Wolf, 2001; Wolf & Colditz, 1998). In 1995, the direct and indirect costs related to obesity in the U.S. were reported to total US$51.6 billion and US$47.6 billion (Wolf & Colditz, 1998). Another report, offered that in 1995 direct costs alone totaled US$70 billion, which is representative of 7% of health care costs (Colditz, 1999). Further, in 2004 the calculated obesity-related cost per capita was greatest in the United States, followed by Canada, the Netherlands, and France (Caterson, Franklin, and Colditz, 2004). These estimates accounted for roughly 5.7% of health care costs in 1995 (Wolf & Colditz, 1998).

According to a report published by the American Heart Association (AHA) childhood overweight and obesity is one of the nations "most critical public health problems that threatens to ultimately reverse the favorable trends in cardiovascular morbidity and mortality that have occurred during the past half-century" (Daniels et al., 2005, p. 2009). This statement clearly identifies the severity of childhood obesity, links obesity to what was previously recognized as an adult onset disease. Continued research reinforces the adverse health outcomes of obesity. Through extensive longitudinal, population-based, surveillance, and randomized controlled studies a multitude of health consequences of obesity have been identified inflammation, insulin resistance, hyperlipidaemia, gall bladder disease, osteoarthritis and certain cancers as several adverse consequences of obesity (Daniels et al., 2005; Must & Strauss, 1999; Reilly et al., 2003).

Ongoing research investigating the consequences of obesity continues to suggest the association between obesity and two chronic diseases: (a) cardiovascular disease and (b) metabolic syndrome (Berenson et al., 1998; de Ferranti et al., 2004; Freedman, et al.,1999; Gutin et al., 2004; Weiss et al., 2004; Whincup et al.,2005). Empirical evidence of the association between obesity and these two adverse health outcomes will be presented in this section.

Cardiovascular Disease

Excess adipose tissue in childhood has been noted as a risk factor for developing coronary heart disease or related adverse changes in cardiovascular health. In 2005, Whincup et al. conducted a study to investigate arterial distensibility, a marker of early arterial disease, in adolescents. Anthropometric measures such as adiposity, blood pressure, fasting blood lipids, and fasting insulin levels were collected from British adolescents (*N*= 471) aged 13-15 years old. The correlation measures revealed a strong inverse and graded relationship between adiposity levels and vascular functioning in the sample population. If not detected early this adverse relationship between adiposity and arterial distensibility may have even greater detrimental effects to the health and functioning of young people. As a result, the authors urge for early detection of arterial distensibility and advocate for population-based strategies to reduce adiposity in adolescents.

Findings from Whincup and his colleagues (2005) gained support from work done by Juonala et al (2005). Their longitudinal study of the effects of childhood obesity on vascular function revealed again adverse effects. A cross-sectional survey of participants aged 3-18 years old was conducted in 1980 and then again in 2001. The total number of complete data sets was 2,225. Data that were collected from participants at baseline and at follow-up were measured using a noninvasive ultrasound and included carotid artery compliance, Young's elastic modulus,

a stiffness index, and three measures of large-artery elasticity. The results provided risk factors identified in childhood associated with skinfold thickness, decreased carotid artery elasticity in adulthood as high LDL cholesterol, high blood pressure, and low HDL cholesterol. These findings provide population-based and longitudinal evidence that the coupling of adiposity and other risk factors in childhood have negative effects on the health in adulthood.

Goodman, Dolan, Morrison, and Daniels (2005) presented the combination or clustering of risk factors to adverse longitudinal health outcomes. A cross-sectional study was conducted with participants in grades 7-12 (*N*=1,578) in a school in Ohio that served to identify that cardiovascular risk clustering is present in adolescents. The authors concluded this through collection of anthropometric measures indicative of cardiovascular risk- these measures included cholesterol, triglycerides, fasting insulin and glucose, body mass index, waist circumference, fibrinogen, and blood pressure. From here, the individual factors were clustered and an exploratory factor analysis was conducted to identify both independent factor and factor loading scores. The analysis provided cumulative risk scores for cardiovascular disease. Results indicted that obesity was a predominant correlate of cumulative risk in adolescents.

Metabolic Syndrome

In 2004, the National Heart, Lung and Blood Institute and the American Heart Association identified metabolic syndrome as a primary contributor to cardiovascular disease (Grundy, Brewer, Cleeman, Smith, & Lenfant, 2004). By definition, metabolic syndrome is a complex combination of risk factors, which include behavioral and environmental factors as well as some genetic components (Reaven, 1988). Six risk factors comprise metabolic syndrome, they include (a) abdominal obesity, (b) atherogenic dyslipidemia, (c) raised blood pressure, (d) insulin resistance, (e) proinflammatory state, and (f) prothrombotic state (Grundy et al., 2004). The

clustering of three or more factors noted above signal metabolic syndrome, yet the factor that is most strongly associated with metabolic syndrome is abdominal obesity (Grundy et al., 2004).

Factors associated with metabolic syndrome in children and adolescents have been investigated within recent years due to the increased prevalence of obesity in young people. A study in 2004 investigated the varying degrees of obesity on the prevalence of metabolic syndrome in 439 obese, 31 overweight, and 20 non-obese children (Weiss et al., 2004). Anthropometric measures revealed greater prevalence of metabolic syndrome with increased severity of obesity. In addition, the prevalence of the condition was also positively associated with insulin resistance, even after adjusting for ethnicity and degree of obesity.

A 2004 population-based survey that investigated health risks in adolescents, provided data to suggest that overweight and obese adolescents are 20% more likely to develop metabolic syndrome than their normal weight peers (de Ferranti et al., 2004). These findings gained support by Gutin, Barbeau, and Yin (2004) as their study of 7-11 year olds identified body fat percent to be highly correlated with increased fasting insulin concentrations, which are both primary components of metabolic syndrome. The evidence that provides incidence rates of children and adolescents enhances the notion that obesity has multiple detrimental health effects in the lives of young people.

The dynamic nature of metabolic syndrome includes the composition of a triple threat of risk factors. The recognition of the prevalence rates of children and adolescents who have developed or are at risk of developing metabolic syndrome is indicative of the poor health condition that many young people are faced with. Although abdominal obesity is a single factor that contributes to metabolic syndrome, the exponential effects of this one factor have proven to be detrimental and most telling in the prediction of risk of developing this metabolic condition

(Grundy et al., 2004).

In conclusion, the dynamic nature of obesity in children and adolescents continues to arouse international attention. Scholars have expended great effort to define associated risk factors and health outcomes of childhood obesity. Through these efforts, consensus of the interrelationship among factors such as physical activity, nutrition, and sedentary pursuits contribute to the development of obesity. Outcomes of these findings highlight negative health and social effects and continue the investigation of consequence of childhood obesity

Known Causes of Childhood Obesity

The studies of the consequences of obesity have caused international scholars to analyze the factors leading to obesity in children and adolescents. Findings from these efforts have informed the development of treatment, intervention and prevention programs within community, clinical, and educational settings. The WHO (1996) defines the etiology of obesity as an accumulation of excess adiposity tissue, which is a result of an imbalance between energy intake and energy expenditure (Daniels et al., 2005). Figure 2.1 illustrates the impact that various interacting factors have been observed as influencing the development of this disease (WHO, 2000). The American Academy of Pediatrics noted the dynamic nature of obesity through interrelation among "genetic, biological, psychological, socio-cultural, and environmental factors" (2003, p. 425) that presents a challenge for scholars to diagnose a direct cause and effect of independent factors. Because it appears that many factors may influence obesity, a diverse range of factors have been investigated, from age, gender, race/ethnicity, geographical distribution, parental influence, breast feeding, dietary patterns, and others.

Through a review of empirically based literature, three prominent factors appear consistently. Further, these three factors are often identified in combination to one another and

are noted to have some degree of interrelatedness. The factors are: a) physical activity, b) nutrition, and c) modern technology use (Berkey et al., 2000; Ekelund et al., 2005; Lowry, Wechsler, Galuska, Fulton, & Kann, 2002; Must & Tybor, 2005; Storey, Forshee, Weaver, & Sansalone, 2003; Vermorel et al., 2005). Each one is behavioral in nature, and therefore may also be influenced or modified by environmental structures, social support, and personal decisions. It is acknowledged by the author however, that these three risk factors are not fully inclusive of all recognized risk factors of obesity. A discussion of each factor will commence with evidence provided by the empirically based literature. At the conclusion of this section, an overview of how these three factors might be utilized collectively to curb childhood obesity.

Physical Activity

The landmark study conducted by Corbin and Pletcher in 1968 found that physical inactivity of school-aged children was related to obesity in children. The researchers captured physical activity patterns of 50 fifth-grade children and analyzed the dietary habits of the participants, and through their efforts concluded that obese children participated in less physical activity than their non-obese counterparts (Corbin & Pletcher, 1968). This vital observation heightened awareness that regular physical activity in children may have positive health effects. Additionally at this time, investigations were being conducted within adult populations to investigate the physical activity participation of individuals within varying occupations (Morris, Heady, Raffle, Roberts, & Parks, 1953). Findings concluded that greater occupational physical activity was association with reduced risk of coronary heart diseases and overweight status (Morris et al., 1953). In 1985, Casperson and Christenson defined physical activity as "any bodily movement that results in energy expenditure." With this universally recognized definition, scholars and clinicians now agreed on what physical activity entailed and began study of the

health effects of regular physical activity. These landmarks studies provided momentum in research of physical activity and exercise promotion to guided research examining the inverse relationship between physical activity and disease prevention.

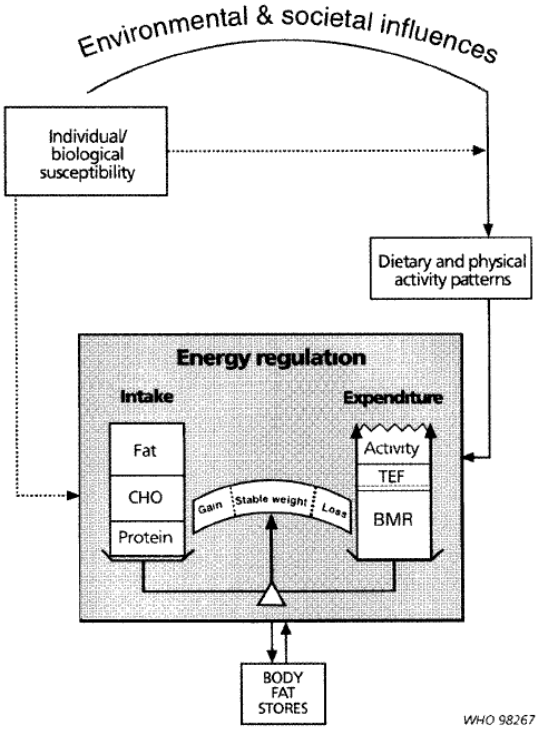

Figure 2.1. Influence on energy balance and weight gain

Note. From "Obesity: preventing and managing the global epidemic: report of a WHO consultation. WHO Technical Report Series" World Health Organization, 2000, p. 103

Utilization of measurement methods such as self-report (questionnaires and physical activity logs), pedometers, accelerometers, heart rate recording, and doubly labeled water; has allotted scholars the means to capture habitual physical activity patterns of young people. Through an extensive review of literature, Must and Tybor (2005) agree there is a consistent

inverse relationship between physical activity and overweight and obesity status in children and adolescents. Investigations revealing these associations in children and adolescents will be presented in the following section.

In 2000, self-report data collected from children aged 9-14 years old revealed a negative correlation between physical activity and BMI, particularly among females (Berkey et al., 2000). Approximately 10,000 children (boys n= 4,620; girls n=6,149) returned questionnaires that measured dietary intakes, physical activities, and sedentary recreational activities (i.e., television viewing and video or computer games). The physical activity instrument used for this study was developed by authors and asked participants to "recall the typical amount of time spent, over the past year, in various activities and team sports" (p. 2). The questionnaire assessed type of activities and time spent in specific activity outside of physical education class per week. Reliability measures of the instrument revealed a moderate degree of reproducibility (r= .49 for girls; r= .53 for boys) and evidence of validity of the measure was calculated with correlation to cardiorespiratory fitness of participants (r=- .23 for girls; r= -.27 for boys) (Berkey et al., 2000). The instrument was administered to participants twice (in 1996 and 1997) and results revealed greater body mass index increases in girls who reported few hours of activity (BMI decreased by .0284 kg/m^2/hour/day activity) during the year between the two BMI measurements.

Results from three population-based studies that utilized self-report methods of collecting behavioral information were compared to reveal consistency regarding physical activity and its effects on obesity in childhood and adolescence (Storey, Forshee, Weaver, & Sansalone, 2003; Janssen, Katzmarzyk, Boyce, King, & Pickett, 2004). The data collected by the National Health and Nutrition Examination Survey III (NHANES) and the Continuing Survey of Food Intake for Individuals (CSFII) were used in comparison of one another. Participants responding to

NHANES III were 12-16 years old, and to CSFII were 6-11 and 12-19 years old. The elements compared between the two data sets relative to physical activity provided an agreed upon negative association between physical activity or team sports participation and body mass index (Storey, Forshee, Weaver, & Sansalone, 2003). These findings were consistent across age groups surveyed. Interestingly, the results of these two U.S. population based survey studies also are congruent with reports from Canadian youth ages 11-16 years (Janssen, Katzmarzyk, Boyce, King, & Pickett, 2004). The 2001/02 World Health Organization (WHO) Health Behavior in School-Aged Children Survey revealed lower physical activity levels in overweight and obese boys and girls than their normal weight peers (Janssen, Katzmarzyk, Boyce, King, & Pickett, 2004). The agreement of the inverse relationship between physical activity and obesity through self-report measures in both U.S. and Canadian children and adolescents spurred an interest in international studies investigating these relationships.

Researchers in Sweden initiated the Stockholm Weight Development Study (SWEDES), which investigated the associations between physical activity and fat mass in adolescents (Ekelund et al., 2005). SWEDES participants were offspring from women who had participated in a previous study. The connection with the mothers of the adolescents allowed for comparison of maternal fat mass to adolescent fat mass and physical activity participation. The authors administered a developed questionnaire to measure information on "the frequency, duration, and intensity of PA [physical activity] in 3 different domains –i.e., school, transportation, and leisure time" during the previous 7 days (Ekelund et al., 2005, p. 356). The validity of the questionnaire was assessed with a small sample of study participants who wore an accelerometer for seven consecutive days, after which the self-report physical activity questionnaire was administered (r= .49). Additional anthropometric and socioeconomic measures were collected from the

participants (*N*= 445). Data collected from adolescents revealed that fat mass was significantly and inversely associated to physical activity in both males and females. However, when body composition measures were replaced with body mass index measures, there were inverse relations to physical activity in males but not in females (Ekelund et al., 2005). Further, after adjusting for possible confounding factors these relationships remained significant for males, but were not observed in females (Ekelund et al., 2005). There was an interesting association between maternal obesity and fat mass measures in daughters, but not in sons.

Another European study that investigated the relationship between habitual physical activity and changes in adiposity indicators was the Fleurbaix-Laventie Ville Santé Study (FLVSII) (Kettaneh et al., 2005). This longitudinal population-based study was conducted in Northern France with normal weight children and adolescents from 1999 to 2001. At baseline and at follow up participants (*N*=436) completed a questionnaire of physical activity (Kriska's Modifiable Activity Questionnaire), wore pedometers for 7 consecutive days, and four measures of adiposity were collected (body mass index, bioimpedance, skinfold measures, and waist circumference). Matched data at follow up indicated leisure time physical activity, ambulatory activity and vigorous physical activity were significantly higher in boys than in girls, whereas no differences were identified between sexes in moderate physical activity (Kettaneh et al., 2005). An interesting finding from these data indicated that girls in groups with highest moderate physical activity levels at baseline were predicted to have the highest adiposity gain at follow-up (Kettaneh et al., 2005). The authors did not provide an explanation for this finding, but did identify that all adiposity indicators "were higher at follow-up in girls who had decreased their moderate physical activity level over time" (Kettaneh et al., 2005, p. 589), which was also an identified trend in boys.

Back in the United States, seventy-four high school aged females (ages 14-17 years) from Southern California were recruited to participate in a study to investigate the effect of physical activity behaviors on obesity (Ischander et al.,2007). Active (n= 37) and inactive (n= 37) females were matched for age and BMI percentile, these groupings allowed comparisons to be made regarding fitness, body composition, and bone mineralization. Measures of height, weight, body composition and bone health were collected from all participants. Additionally, all participants completed the 3-day physical activity recall (3DPAR) questionnaire, performed a progressive ergometer exercise test, and provided blood samples for the purposes of this study (Ischander et al., 2007). Findings from this study support physical activity participation in adolescent girls, as participants in the active group had significantly greater lean body mass, higher fitness, and lower percent body fat than girls in the inactive group (Ischander et al., 2007).

Collectively, scholarship investigating physical activity as an associated factor to obesity in children and adolescents has provided a convincing case advocating the positive health impact these behaviors have on the lives of children (Must & Tybor, 2005). Regardless of the measurement instruments used to capture physical activity behaviors (i.e., self-report, physiologic markers, motion sensors) a consistent theme of the inverse relationship between physical activity and body composition persists. There does appear to be a slightly greater risk for inactive female participants (Berkey et al., 2000; Ischander et al., 2007), but remains significant across age groups (Storey et al., 2003). In summary, throughout empirically based studies physical activity participation has a significant effect on the incidence of childhood obesity.

Nutrition

Nationwide surveillance studies focused on food intake and behaviors of young people have been conducted systematically since the mid 1990's, yet excessive caloric intake has been health concern since the 1940's (Davidson, 1942). Two highly acknowledged U.S. based studies are the Continuing Survey of Food Intake for Individuals (CSFII) (Agricultural Research Service, 1998; Tippett & Cypel, 1998) and the National Health and Nutrition Examination Study (NHANES III) (United States Department of Health and Human Services, 2001). Each will be briefly described and their findings relevant to nutrition and obesity will be presented.

The CSFII study examined the association between lifestyle variables and body mass index of children and adolescents. Data were collected from a sample of 5,739 children (6-11 years old) and 4,182 adolescents (12-19 years old) via two 24-hour dietary recall, height and weight measurements were self-reported by participants. The results suggested a negative association between consumption of carbohydrates less added sugars and body mass index. This association was only noticeable in adolescent participants.

The NHANES study collected data from a nationally representative sample of 4,720 children and 2,216 adolescents (USDHHS, 2001). A physician measured height and weight and one 24-hour dietary recall collected food consumption. Similar to the CSFII, the NHANES data reported a significant and negative association between grams of total fat, carbohydrates less added sugars and body mass index. Additionally, and unique to NHANES, data provided a positive association between body mass index and daily protein intake (g/day) in adolescents.

These two population based surveys provide surveillance data to enhance the understanding of associations between dietary habits, patterns, and behaviors influence body mass index and overweight in children and adolescents. Moreover, they serve as a basis of

baseline data for subsequent comparison studies. For example, scholars have conducted an analysis on these surveillance data for comparison of measures and provide a grander portrait of the incidence of overweight and obesity to guide future epidemiological studies (Storey, Forshee, Weaver, & Sanaslone, 2003).

In 2000, Berkey and colleagues reported their findings that endorsed body mass index increases with greater caloric intake in adolescents (Berkey et al., 2000). Over 10,000 adolescent (males = 4,620; females= 6,149) aged 9-14 years old completed a self-report questionnaire that measured body mass index, habitual eating patterns, physical activity behaviors, and sedentary activities. Baseline and one-year follow up data revealed increases in body mass index in both males and females due in part to maturational growth, but apart from that participants who reported greater caloric intake had larger increases in BMI. The researchers indicated a direct positive association in females between BMI increase and excess daily caloric intake, specifically there was a .0061 kg/m^2 increase per 100 kcal per day.

The results from Berkey and colleagues (2000) were supported by the findings of the Youth Behavior Risk Surveillance (YRBS) that examined the nutritional components of youth food consumption (Grunbaum, Kann, Kinchen, Willams, Ross, Lowry, & Kolbe, 2002). The population-based YRBS study aimed to capture the incidence of behaviors participated in- either risky or positive health behaviors through written questionnaire responses (87 multiple-choice questions). Participants were sampled from all 50 states and the District of Columbia, representing students in grades 9-12 in public and private schools. The nutrition related results indicated that only one in five (21.4%) youth consumed the recommended serving of fruits and vegetables in the five previous days. However variation in fruit and vegetable consumption was noted across ethnic groups, with African American students reporting greater likelihood to

consume sufficient amount (>five servings a day) when compared to Caucasian students. These data appeared consistent across state and local survey data. Additionally, when students were asked to report their attempts at weight control nearly 43.8% of respondents indicated they had "eaten less food, fewer calories, or food low in fat to lose weight or to avoid gaining weight during the 30 days preceding the survey" (p. 324). Caucasian females were significantly more likely to report these practices than other ethnic groups.

Hassapidou, Fotiadou, Maglara, & Papadopoulou (2006) have reported similar findings to the U.S. YRBS study in Greek adolescence. The researchers collected anthropometric data (height, weight, 2 site skinfold) from participants aged 11-14 years old as well as a three-day food diary and activity report. Data identified 31% of male and 21% of female participants to be overweight ($\geq 85^{th}$ percentile). Further, regardless of sex, overweight participants reported consuming more snacks, more sugar, jam, and honey and fewer legumes, vegetables, and fruits than their non-overweight counter parts.

Warner, Harley, Bradman, Vargas, and Eskenazi (2006) continued additional investigation of the association between dietary patterns and overweight and obesity of children. Approximately 350 two-year old Mexican-Americans were interviewed to investigate the association of soda consumption and overweight. These participants were the offspring of low-income Latino women who had enrolled in a study while pregnant; therefore, the children's anthropometric measures were tracked from birth. Data collected from the children indicated that more than half of the youngsters reported consuming soda within the past week. Children who reported consuming more than one soda per day had significantly greater risk of becoming overweight.

In conclusion, nationwide and population sample studies have identified dietary behaviors to be associated with obesity in children and adolescents (Berkey et al., 2000; USDHHS, 2001). Specifically, patterns within the research clearly identify the types of food consumed (Berkey et al., 2000; Hassapidou et al., 2006;Tippet & Cypel, 1998; USDHHS, 2001; Warner et al., 2006) and the amount of caloric intake (Berkey et al., 2000; Hassapidou et al., 2006; USDHHS, 2001) significantly influencing body composition. Findings such as these, point to the imbalance of energy expended and energy consumed, which simply defines and leads to the accumulation of excess adipose tissue (WHO, 2000).

Modern technology

Technological advances in today's society have provided conveniences and simplicity to everyday tasks. Fox (2004) argues, "children's lives are becoming less and less 'user friendly' for activity and more seductive for inactive pursuits" (p. 34) and further posits that cultural norms have provided children with few options other than sedentary behaviors. Modern technologies, such as television viewing, video games, and computer, available to children in the 21st century have been identified as contributing to significant reductions in leisure time physical activity and indirectly overweight and obesity (Berkey, Rockett, Field, Gillman, Frazier, Camargo, & Colditz, 2000; Robinson, 1999; Hager, 2006; Storey, Forshee, Weaver, & Sansalone, 2003). An small, yet inverse relationship between physical activity and television viewing has been reported (Hager, 2006) and further attempts to identify a threshold (hr/day) of technology use that is associated with increased risk of obesity may provide awareness and technology use reduction campaigns and program development.

In the mid-1990's nationwide surveillance studies conducted by the U.S. Agricultural Department investigated the association of lifestyle behaviors and body mass index in children

and adolescents (Agricultural Research Service, 1998). The data from the CSFII were analyzed relating to sedentary behaviors of participants revealed that in both children and adolescents television viewing was noticeably associated with body mass index measures.

A study conducted by Berkey and colleagues (2000) identified greater body mass index (BMI) increases in boys and girls who spent more time in sedentary recreational activities such as television viewing, watching videos, and playing computer or video games than their more active peers. The study required 9-14 years old boys (n=4,620) and girls (n=6,149) to complete a questionnaire that was developed by the authors that measured typical sedentary recreational activities throughout the past year. The measure required participants to report time spent playing video /computer games (hours per day) on weekdays and separately for weekend days. Participants completed the questionnaire twice (1996 and 1997). The data revealed that boys and girls who reported more time spent engaged in television viewing and video games had greater increases in body mass index (for girls BMI increased by .0372 kg/m ^{2} / hour/day; for boys .0384 ± 0.0106 kg/m2/hour/day) than their more active peers. The authors concluded that young people reporting greater technology use were at greater risk for overweight and obesity (Berkey, Rockett et al., 2000).

A similar study utilizing an ethnically diverse high school aged population of interest investigated the effect of television viewing on overweight and obesity (Lowry, Wechsler, Galuska, Fulton, & Kann, 2002). Eleven and thirty-one percent of the sample population were overweight and reported sedentary behaviors. Of these students, nearly 43% indicated an average of 2 hours of television viewing on school days (Lowry et al., 2002). A statistical analysis of these data identified two or more hours of television per day to be associated with overweight and sedentary lifestyles in Caucasian females and overweight in Hispanic females. Interestingly,

results identified African American males' television viewing positively associated with physical activity participation (Lowry et al., 2002). Subsequent cross sectional research in high school aged females (N=194) revealed comparable results. Schneider, Gridlund, Dunton, and Cooper (2007) collected measures of cardiovascular fitness, percent body fat, BMI, and self-report of time spent in sedentary activities. After controlling for physical activity and cardiovascular fitness, the only significant association to BMI and percent body fat was use of interactive media.

In 2006, Hancox and Poulton published a longitudinal study investigating the association of television viewing time to childhood obesity across a twelve-year period. Three-year old participants were recruited and followed until they were 15 years old (*N*= 1,037). Every two years measures were collected from the participants, these included weight and height, parental television viewing estimates of child between 5 and 11 years, and self-report of TV viewing at 13 and 15 years (Hancox & Poulton, 2006). Findings suggested that BMI and prevalence of overweight at all ages were significantly associated with mean hours of television viewing. Associations were stronger in females than in males.

Population based studies of modern technology use and the relationships to overweight and obese status have been conducted in the United States and developed countries. In the United States, the National Health and Nutrition Examination Survey III (NHANES) and the Continuing Survey of Food Intake for Individuals (CSFII) measure health behaviors in children and adolescents. Scholars conducted a comparison of the most recent data collected from these two population based surveys with an interest in identifying the effect of technology use on obesity (Storey, Forshee, Weaver, & Sansalone, 2003). The analysis revealed television watching was "markedly associated" to BMI in both children and adolescents from these self-report data

sources (Storey et al., 2003). Data from the CSFII revealed statistically significant relationships between hours of television viewing and overweight status in children aged 6-11 (2.22 hr/day, $p< 0.05$) and adolescents aged 12-16 (3.60 hr/day, $p<0.01$). A similar dose was identified in the NHANES data for children aged 6-11 (3.41 hr/day, $p< 0.01$) but not statistically significant for adolescents (Storey et al., 2003).

Taken together, these studies depict how the modern lifestyle of children and adolescents are influenced by technology use; which in turn has secondary consequences on body composition and obesity (Berkey et al., 2000). Across age groups, sex, and race/ethnicity children and adolescents who engage in greater amounts of television viewing have significantly higher BMI measures (Hancox & Poulton, 2006; Lowry et al., 2002; Storey et al., 2003).

Summary of Causes

Research and scholarship has clearly detailed the etiology of childhood obesity is a complex and dynamic interrelation of varying factors (WHO, 1996; WHO 2006). The findings of the associations among behavioral factors (i.e., physical activity, nutrition, and technology use) and obesity in children and adolescents (Berkey et al., 2000) highlights several influencing factors that contribute to the development of overweight and obesity. The understanding of the social and personal factors contributing to this growing contemporary health issue is important because this enables subsequent prevention and intervention strategies to be enacted to address these particular factors. The progress and influx of empirical evidence has been substantial. The next step is to discover how those who are outside of academia, research, and medicine perceive childhood obesity. The following section will provide a review and examination of the efforts taken to measure the publics and other sub-population's perceptions and attitudes towards this health threat called obesity.

Public Perceptions of Childhood Obesity

Within recent years, the aggregation of public perceptions of childhood obesity has become a topic of interest for scholars, politicians, and medical professionals. Given the increase in government awareness and mass media campaigning of obesity related issues, scholars were urged to delineate the likelihood of Americans supporting political/public policy established by government officials. In 2001, scholars from Harvard University conducted the first public opinion poll concerning the seriousness of obesity in the United States (Oliver & Lee, 2005). The results from the Harvard Poll suggested that Americans were not concerned with obesity, as it was not identified as a serious health threat to the nation. The report indicated that less than one in ten people felt obesity was a leading health concern in American. Interestingly, however a year later one quarter of polled participants identified obesity as a top health issue, this was an increase of approximately threefold. This unanticipated increase was acknowledged as positive and appeared to align with greater public awareness and higher levels of support for political policies and preventative measures enacted to address obesity.

Similarly, in 2006, the *Wall Street Journal Online* published findings from an online poll of 2,078 American adults, ages 18 years and over, of whom 432 were parents or guardians of children age 12 and under, that collected the opinions of the significance of childhood obesity in the U.S. (Cummings & Harris Interactive, 2006). Results indicated that 74% of surveyed parents or guardians ($\underline{n} = 432$) acknowledged childhood obesity in the U.S. as "a major problem", up from 70% in 2005. Of all surveyed adults, including non-parents and guardians, the percentage recognizing childhood obesity in the U.S. as a major problem was up 7% (Cummings & Health Interactive, 2006). Oliver and Lee (2005) postulate that opinion formation is a unique phenomenon that is influenced by multiple factors. The four factors noted by Oliver and Lee

(2005) to most influence opinion development are one's: a) degree of interest and awareness of, b) beliefs relative to the causes of, c) understanding and attitude relative to different but seemingly similar issues, and d) self-interest of an issue (Oliver & Lee, 2005). It is important to acknowledge the interaction of these factors as they contribute to the formation of opinions, beliefs and ultimately actions relative to particular issues. In efforts to address these elements of opinion formation and proliferation, scholars have utilized multiple methods to collect opinion data and have focused on diverse concepts that investigate public and individual opinions of obesity-related issues. These methods and highlighted concepts will be discussed.

Health-Related Locus of Control

Addressing the second prevailing component posited by Oliver and Lee (2005) that influences opinion development as understanding one's beliefs relative to the causes of something, locus of control is an individual difference construct that epitomizes the exploration of influencing factors and causes of something. Derived from Rotter's social learning theory (1954) the construct of locus of control has been identified as a valid predictor and exponent of specific health-related behaviors such as smoking reduction (Straits & Sechrest, 1963), birth control utilization (MacDonald, 1970), and weight loss. Social learning theory presumes that as an individual's exposure to a given situation increases, so does the development of specific expectancies, thus playing "a greater role in determining one's future behavior" in that particular situation (Wallston, Wallston, Kaplan, & Maides, 1976, p. 580).

In light of social learning theory (Rotter, 1954), there rose an attempt to explain and measure contributing components of social learning and therefore subsequent behaviors. Of particular interest to this study, is within the realm of physical health. Health-related locus of control is supposed to measure and foretell how one perceives the factors in control of one's

sickness or wellness. Wallston, Wallston, Kaplan, and Maides (1976) posited that Health Locus of Control (HLC) was a linear construct wherein an individual could only believe health to be controlled by either internal (self) or external (others) factors. To measure this proposed one-dimensional construct of HLC, the authors established eleven items based on a 6-point Likert scale encompassing internal and external statements of control, shown in Table 2.2.

Table 2 .2.

Health Locus of Control Scale Items

Item	Direction
1. If I take care of myself, I can avoid illness	Internal
2. Whenever I get sick it is because of something I've done or not done.	Internal
3. Good health is largely a matter of good fortune.	External
4. No matter what I do, if I am going to get sick I will get sick	External
5. Most people do not realize the extent to which their illnesses are controlled by accidental happenings.	External
6. I can only do what my doctor tells me to do.	External
7. There are so many strange diseases around that you can never know how or when you might pick one up	External
8. When I feel ill, I know it is because I have not been getting the proper exercise or eating right.	Internal
9. People who never get sick are just plain lucky.	External
10. People's ill health results from their own carelessness.	Internal
11. I am directly responsible for my health.	Internal

Note: From Wallston, Wallston, Kaplan, & Maides, 1976 p. 581

Validity studies have been conducted to investigate the relationship between HLC beliefs and health behaviors. A specific study utilizing this instrument, involved college-aged participants in a hypertension educational session, results indicated that within individuals with pre-existing high health values the relationship between internal-HLC beliefs tended to exposed themselves to more educational materials and demonstrated pro-active behaviors relative to hypertension (Wallston, Wallston, Kaplan, & Maides, 1976). Minimal interaction effects were noted with low health value participants. The authors established that subsequent investigations and testing of the newly developed instrument would serve to further clarify if the health-related locus of control beliefs were predictive of behaviors.

As the Wallston and colleagues continued validation efforts, the discussion of health-related locus of control as a one-dimensional construct was being disputed by Levenson (1973, 1974, and 1975). She proposed the addition of a third dimension, chance, to the locus of control construct. Levenson hypothesized that the construct could be further improved by understanding how fate and chance contribute to an individual's belief of health circumstances. As a result, a third distinct dimension of health locus of control was added and items were developed to transform the linear HLC scale into the Multidimensional Health Locus of Control (MHLC) scale (Wallston, Wallston, & DeVellis, 1978). The complete list of MHLC items is presented in Table 2.3.

Table 2.3

Multidimensional Health Locus of Control items (MHLC)

Item	Dimension
1. If I get sick, it is my own behavior which determines how soon I will get well again.	Internal
2. No matter what I do, if I am going to get sick, I will get sick.	Chance
3. Having regular contact with my physician is the best way for me to avoid illness.	Powerful Others
4. Most things that affect my health happen to me by accident.	Chance
5. Whenever I don't feel well, I should consult a medically trained professional	Powerful Others
6. I am in control of my health	Internal
7. My family has a lot to do with my becoming sick or staying healthy.	Powerful Others
8. When I get sick, I am to blame.	Internal
9. Luck plays a big part in determining how soon I will recover from an illness.	Chance
10. Health professional control my health	Powerful Others
11. My good health is largely a matter of good fortune	Chance
12. The main thing which affects my health is what I myself do	Internal
13. If I take care of myself, I can avoid illness.	Internal
14. Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have	Powerful Others

been taking good care of me.	
15. No matter what I do, I'm likely to get sick	Chance
16. If it's meant to be, I will stay healthy.	Chance
17. If I take the right actions, I can stay healthy.	Internal
18. Regarding my health, I can only do what my doctor tells me to do.	Powerful Others

Note: Form A from: http://www.vanderbilt.edu/nursing/kwallston/mhlcscales.htm

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The MHLC scale has been utilized to measure changes of health locus of control beliefs within multiple population groups (Nicholson, 1980). For example, early investigations included individuals attending a YMCA health fair; respondents completed the MHLC scale with the intent of depicting the belief-type of individual seeking personal health-relevant information (Rosenblum, 1979). Additional studies utilizing the three-dimension scale provided further evidence of validity and statistical independence of the dimensions. Specifically, internal consistency and stability across population samples were identified (Chaplin, Davidson, Sparrow, Stuhr, Van Roosemalen, & Wallston, 2001; Willis, Wallston, & Johnson, 2001).

Implications for health practitioners, educators, and administrators revolve around the concepts derived from the MHLC scales in that health-based programs could be tailored to individual's locus of control beliefs. Matching program components with subject or stakeholder's attitude beliefs could potentially enhance the effectiveness and substantial meaning of the programs. Several early studies have shown weight loss programs to be most effective

when matched and outcome variability in internals and externals. This was evident in the following remarks by Wallston, Wallston, and DeVellis (1978):

> An internally oriented program should provide more choice of treatment, more involvement of the patient in making choices, and in general strong emphasis on individual responsibility. An externally oriented program might be designed to move individuals who believe in chance to believe that their health can be controlled, even if it is dependent upon powerful others. … Externally oriented programs might also stress reliance on social support systems and the importance to the individual of compliance with health professionals' instructions" (p. 114).

Another example of health care professionals investing in patient preferences is evident in the 2004 study conducted by Britto, DeVellis, Hornung, DeFriese, Atherton, and Slap whereby a survey was developed to measure what health care preferences and priorities adolescents with chronic illnesses would prefer. The premise for this instrument revolved around improving the quality of health care in the United States and directing the attention toward patient-entered care. The concept of increasing health care provider responsiveness to patient need would encourage "an alliance between patient and provider that encourages the sharing of power and responsibility" (Britto et al., 2004, p. 1272; Mead & Bower, 2000). To capture the health care priorities of the patient, a valid instrument was necessary and deemed strategic in the enhancement of effectiveness of health care. Insight such as this regarding program components matched to individual and/or stakeholder perceptions of health-related locus of control could vastly enhance the participant-centeredness of childhood obesity related prevention interventions.

Methods of Measurement of Public Perception of Obesity

Methods of capturing public perceptions and opinions appear consistent within the literature. Methods most commonly utilized include focus groups, personal interviews, telephone surveys, and written surveys (paper/pencil and electronic/online). However, the two methods often used to gather public opinion of obesity have been telephone surveys and written surveys. Both of these strategies have noted strengths and limitations that will be briefly discussed.

Telephone survey. Specific to this area of research, studies conducted within the United States that have gathered general public opinions of obesity have solely utilized telephone surveys (Evans, Finkelstein, Kamerow, & Renaud, 2005; Evans, Renaud, Finkelstein, Kamerow, & Brown, 2006; Oliver & Lee, 2005). Telephone surveys typically require an interviewer to follow a prepared script that is essentially a written questionnaire over the telephone with a participant. An element that makes a telephone survey different from a written survey is that the interviewer is able to ask probing questions about participant responses. The telephone survey generally takes no longer than ten minutes and is a fast method of gathering information from a large sample (Thomas & Nelson, 1996). A limitation of telephone surveys noted by Evans and his colleagues (2006) was the recent reduction in residential phone lines in the United States because of increased cellular phone use.

An example of a telephone survey that has been utilized to collect public opinion of support for obesity-related policy, was data collected via the American Attitudes Towards Obesity (AATO) questionnaire in 2001 and 2002 (Oliver & Lee, 2005). The purpose of the investigation was threefold to measure: a) public knowledge and attitudes of obesity, b) negative stereotypes of and discrimination against the obese and c) public support of public policies targeting obesity. The sample was designed to represent the U.S. population and phone survey

data were collected from 909 adult respondents (Oliver & Lee, 2005). Respondents indicated that concerns of obesity ranked behind cancer, AIDS, heart disease, diabetes, and smoking as a very serious health concern (Oliver & Lee, 2005), suggesting that at this point Americans were neither interested nor aware of the significance and seriousness of obesity to the health of the public. Additionally, environmental (poor nutritional quality of foods in restaurants) and personal attributes (lack of willpower) as explanations for the prevalence of obesity (Oliver & Lee, 2005) was more frequently than genetic explanations. In correspondence to the measure of public concern of obesity, there was low support for obesity related policy and initiatives. For instance, health initiatives such as "motorcycle helmets (favored by 81%), taxing cigarettes (supported by 65%), or banning public smoking (favored by 68%)" (p.935) were highly favored, but support for eliminating junk food from schools as a health initiative was agreed upon by less than half of the respondents (Oliver & Lee, 2005). Substantial demographic variation was evident in respondents support for obesity related initiatives and obesity-related policy.

Other landmark investigations of public perceptions of childhood obesity utilizing telephone survey methodology were conducted in 2005 and 2006 led by lead author Douglas Evans (Evans et al., 2005; Evans et al., 2006). The 2005 investigation served to highlight public perception concerning obesity reduction strategies. A telephone survey instrument was developed to capture public "opinions of seriousness of childhood overweight and obesity compared with other youth issues; support for specific interventions; potential barriers to support" (p. 27) and was administered to 1,010 adults over 18 years old (59% female) (Evans et al., 2005). Only forty-one percent of the respondents indicated childhood obesity was a very serious problem, which ranked similarly to tobacco use (42%), but was not seen as serious as drug abuse among adolescents (55%) (Evans et al., 2005). Table 2.4 describes participant

responses relative to factors contributing to a 'significant amount' of increase in childhood obesity. Leading factors identified were associated with nutritional issues, with the consumption of junk food and sodas being the leading response (77.0%) and followed by consumption of fast food (64.5%). Whereas exercise related factors were noted as less significant with the lack of exercise in school (44.2%) and lack of places to exercise (25.7%) appearing at the bottom of the list of contributing factors (Evans et al., 2005). During the telephone survey, interviewees were also asked to respond in favor or against specific obesity intervention strategies. The intervention strategies most supported by the participants were school-based interventions with the leading intervention being "requiring schools to teach students health eating and exercise habits" (favored by 93.9%), "increasing promotion and marketing of healthy foods and drinks in school vending machines" (supported by 85.4%), and "requiring more physical education classes in school" (favored by 82.3%) (Evans et al., 2005, p. 30). Interestingly, participants in favor of increased physical education classes were not willing to have the increases come at cost of reductions in time allocated for basic education. This study also identified the public's opposition to "tax-based or regulatory strategies to reduce childhood obesity" (p. 29). Additional socio-demographic factors were calculated in favor to or in opposition of specific obesity reduction strategies.

Table 2.4

Public Perceptions of Factors Influencing Childhood Obesity (N= 1,010)

Believe that the following factors have contributed "a significant amount" to increase in childhood obesity	*n*	%
Junk food and sodas	806	77.0
Fast food such as McDonalds	677	64.7
Watching >= hours TV per day	593	56.6
Video games or the Internet	570	54.4
Lack of exercise in school	463	44.2
Lack of places to exercise	269	25.7
Crime	186	17.8

Note. From "Public perceptions of childhood obesity" by Evans, Finkelstein, Kamerown, & Ranaud, 2005, American Journal of Preventative Medicine, *28*(1)

The 2006 study led by Evans was the second study that utilized the telephone survey instrument (see Evans et al., 2005) designed to collect public perceptions and opinions on obesity intervention strategies. This study provided an examination of change in perceptions from the 2005 baseline data to a 9-month follow up using the modified version of the instrument from the previous study. Telephone surveys/interviews were conducted with 1,139 adults over the age of 18 years old (65% females) from all fifty states including District of Columbia (Evans et al., 2006). Compared to the first study, surveyed respondents indicated a significant increase in respondents who considered childhood obesity a very serious problem (from 41% to 47%) in the

United States (Evans et al., 2006), which was the only health threat that represented with a significant increase. Data collected from this study provided an examination of participant support of interventions strategies. The results revealed similarities between the baseline data and the follow-up, with three noted exceptions:

> First, support for providing students who are obese with weight-loss and exercise programs in school increased significantly (p<. 05) from nearly 73% to nearly 80%. Second, support for prohibiting the advertising and promotion of fast food and less healthy foods marketed to children increased significantly (p<. 001) from nearly 48% to nearly 53%, thus representing majority support. Third, support for requiring standardized food portions in restaurants increased significantly (p<. 01) from approximately 42% to 49%" (Evans et al., 2006, p. 173).

This study identified consistency between baseline and follow up telephone surveys regarding a lack of support of increases in unhealthy food costs. Additionally, participants with children were less supportive of all types of weight evaluation and record keeping at schools than those without children. An intervention strategy supported by parents that was not supported by non-parents was the "increased promotion of healthy foods in vending machines" (Evans et al., 2006, p. 173) in schools.

These above noted studies utilizing telephone survey methodology have yielded important findings that inform how the public perceive obesity related issues and also the degree of support for obesity-related interventions. These findings assist in the development and implementation of specific obesity intervention strategies. However, there are limitations to telephone survey methodology that should be considered. First and foremost, telephone survey content or scripted questions are rarely available for replication studies with different sample

populations (with exception of large-scale nation-wide surveys such as the National Health Institute Study (NHIS, 2007) and National Health and Nutritional Examination Study (NHANES, 2005)). An additional limitation to this methodology is the significant manpower required to complete an extensive phone survey study- as the time to complete the telephone calls ranging in duration of (20-30 minutes), often research agencies are hired to complete the phone calls and aggregate the data. Perhaps the utilization of written survey instruments would allow for others to conduct replication studies using the same data collection instrument and varying populations to better understand what laypersons within communities believed about obesity and strategies they would support or oppose in curbing obesity in children.

Written survey. Therefore, a second method often used to gather public perceptions of obesity is written survey instruments. It is important to note that the development of and administration of written surveys in this line of public opinion of obesity has only been done in Australia (Covic, Roufeil, & Dziurawiec, 2007; Hardus, van Vuuren, Crawford, & Worsley, 2003). Written surveys are identified as ideal for gathering data from large sample sizes or from various geographical areas (Dillman, 2006). One element of written surveys that reduces bias is the elimination of an interviewer (as mentioned in the telephone survey). A limitation for written surveys is low response rates.

An example of a study that utilized a written survey instrument to gather public perceptions of the causes and prevention of obesity among children was conducted by Hardus, van Vuuren, Crawford, & Worsley (2003). The objective survey instrument was developed with twenty-five possible causes of obesity and thirteen preventative measures that participants were asked to rate on a four-point scale of importance. Over a two-day period in November 2002 researchers went to a shopping center in Melbourne, Australia and collected survey responses

from 315 randomly selected adults (33% males) (Hardus et al., 2003). Forty-six percent of the approached individuals agreed to complete the survey. The exploratory factor analysis calculations depicted an eight-factor design, accounting for 65% of the total variance. The eight factors included (in receding order of variance explained): *Parental responsibility, Modern technology and media, Over consumption of food, Children's lack of knowledge and motivation, Physical activity environment, Lack of healthy food, Lack of physical activity, Unnamed Factor 8.* The range of reliability alpha values across the eight factors was 0.21- 0.85 (Hardus et al., 2003). Through this investigation, it was evident that several factors strongly emerged to measure the causes of childhood obesity, but some appeared to be less stable. This may indicate the challenges of measuring perceptions of this latent construct.

Participant responses about the causes of childhood obesity indicated that the two leading instigating factors were consumption of fast foods and media promotion of unhealthy foods (Hardus et al., 2003). Table 2.5 identifies participant beliefs of obesity preventative strategies. There was an identified consensus among multiple strategies including:

> "the promotion of healthy eating during children's television viewing, the provision of healthy food at school, compulsory daily physical education at school, obesity prevention strategies that target non obese as well as obese children, regular government funded eating campaigns in the mass media, and the highlighting of the energy content of foods on their labels" (Hardus et al., 2003, p. 1457).

The data were consistent with previously noted studies with the notion of less support for coercive measures such as 'banning of food advertising during children's television programs or additional tax on high-fat foods.'

Table 2.5

Public Perceptions of Important Obesity Prevention Strategies (percentage)

	Very Important	Extremely Important
Healthy eating during children's television viewing	35	56
Healthy food at school	34	55
Compulsory daily physical education at school	32	49
Obesity prevention strategies that target non obese as well as obese children	24	16
Regular government funded eating campaigns in the mass media	37	39
Highlighting of the energy content of foods on their labels	33	46

Note. From "Public perceptions of the causes and prevention of obesity among primary school children" by Hardus, van Vuuren, Crawford, & Worsley, 2003, *International Journal of Obesity, 27.*

Data were analyzed with respect to demographic factors. Hardus and colleagues identified that females responded higher within two categories of causes of obesity in children than male respondents. Females were more likely to note that 'modern technology and media' and 'physical activity environment' were contributing causes of obesity, whereas males indicated that 'lack of physical activity' a cause of obesity more often than women (Hardus et al., 2003).

Relative to parental status, the data revealed that parents responded higher than non-parents in three categories of causes of childhood obesity- they were 'modern technology and media', 'physical activity environment', and 'lack of physical activity' (Hardus et al., 2003). Further, parent's perceptions of preventative measures were in greater support of 'government action' factors than non-parents.

In contrast to the Australian survey respondents noted above (Hardus et al., 2003), American-based poll situated parent and guardians (N = 432) further from government action and regulation to combat obesity in children (Cummings & Health Interactive, 2006). Responses to an opinion poll offered by the *Wall Street Journal,* only 37 percent of parent respondents indicated support to local governmental zoning regulations of fast food restaurants near schools and only 55% indicated support to government related regulations of food advertising to children (Cummings & Health Interactive, 2006). Rather, participants consistently promoted the integration of preventative actions in educational institutions and homes of children, based primarily in the context of physical activity and nutrition. (Cumming & Health Interactive, 2006). It is important to note, that the sample distribution of this 2006 poll was executed electronically through a public-accessed newspaper, however the propensity of having access to the internet and being online reading The *Wall Street Journal* does present a potential bias and margin of error to the findings presented above. In light of this, the data are supplementary to empirical based research, while the limitations to the poll are acknowledged and readily recognized.

Another investigation of public opinion of childhood obesity that provided insight to parental support of individual and institutional-based solutions rather than government sanctioned programs was conducted in Australia in 2007 (Covic, Roufeil, & Dziurawiec, 2007).

The purpose of study was to develop an instrument to measure community beliefs of the causes, consequences and potential solutions of childhood obesity. To do this, the written survey had forty-six questions related to causes of, forty-eight questions pertaining to consequences of, and twenty-one questions related to potential solutions to childhood obesity (Covic et al., 2007). Five factors were derived from the principal components factor analysis about the beliefs of the causes of childhood obesity. The factors included (in hierarchical variance accounted for order), *Emotional eating, Eating habits and food knowledge, Environmental dysfunction, Abundance of contemporary lifestyle,* and *Cost of contemporary lifestyle.* These five factors accounted for 42% of the variance. Researchers administered the written survey to community members through approaching potential participants within neighborhoods and local schools. A total of 434 adults (69% female) completed the survey. Approximately seventy-eight percent of individuals approached agreed to complete the written instrument (Covic et al., 2007).

Results from this survey provided insight to what community members believed were prominent causes of, consequences of, and potential solutions to childhood obesity. First, through their responses, participants indicated that the four most strongly endorsed causes of childhood obesity were ‘ family eating habits’, ‘eating lots of fatty foods’, ‘overeating’, and ‘easy access to fast foods’ (Covic et al., 2007). From the 46 questions relating to causes of obesity, five categorical factors were derived. Of the five factors, the one that represented the greatest number of causes endorsed by the participants was titled *Eating habits and food knowledge* (mean=4.00; SD=0.65). Second, relative to the perceived consequences of childhood obesity, the four most agreed upon consequences were ‘ have poor fitness’, ‘heart disease’, ‘adult obesity’, and ‘high cholesterol’ (Covic et al., 2007). In terms of the 48 questions describing

consequences, four factors were identified. The factor category containing the most endorsed consequences was entitled *Known consequences of obesity* (*M*= 3.87; SD=0.57).

The third finding was inference to community member beliefs of potential solutions to childhood obesity. These data indicated that participants strongly endorsed four solution items, which included 'more physical exercise', 'parents provide healthy food choices', 'educate child about healthy eating', and 'parents provide more positive role models for healthy lifestyles' (Covic et al., 2007). A factor analysis of these data were conducted to determine the primary factor possessing the strongest endorsement solution included items depicting parent behaviors and responsibility, therefore was titled *Parental actions* (mean= 4.19; SD=0.37). Which as reinforced by previous findings, study participants most strongly advocated for solutions to be "addressed at the family level, rather than a broader social level" (Covic et al., 2007, p. 129).

As Covic and colleagues (2007) continue validation efforts on their newly developed survey instrument the preliminary findings contribute to the scholarly discourse of obesity prevention strategies be integrated into the social level of the home and focused contextually on actions and behaviors of parents and children. Recognizing what stakeholders in children's health believe to be of significance in combating obesity could assist in the development of sustainable programs. Additionally, this study identifies that Australian adults recognize the complexities of childhood obesity- that is the multifaceted components that contribute to the condition, as well as the detrimental health outcomes of the condition.

The two written survey instruments developed by Hardus and his colleagues (2003) and Covic and her colleagues (2007) contribute to understanding public perceptions of the causes, consequences, and potential solutions to childhood obesity. These data may provide useful data in guiding the development of future intervention studies within communities. Further, other

scholars may perhaps choose to utilize the written survey as an instrument to collect data within varying populations or communities to also gauge that which factors the public perceives contribute to and that which may be seen as solutions to childhood obesity.

Both the telephone and written surveys described above have been effectively utilized to elicit responses from people to inform public opinion in both the United States and Australia. The development of these surveys, both telephone and written, have focused on different research questions and varying aspects of obesity-related issues. These studies have provided foundational knowledge of public opinions and perceptions of issues relating to obesity and childhood obesity. The value of these data are incredible and may be utilized to develop future intervention programs with aim to reduce or curb childhood obesity. Scholars have focused on public opinion and perceptions to offer essential information about knowledge, beliefs of childhood obesity and also their support or endorsement of specific obesity intervention strategies. Further, scholars have collected demographic information from their respondents and have analyzed the data to represent the perspectives of varying "groups" of individuals. One particular demographic factor of particular interest is whether or not the participant is a parent (particularly of school-aged children). One benefit of delineating parental status allows researchers insight on how individuals so intimately involved in the lives of children believe and would support particular strategies aimed at improving the health and well being of children; in particular the reduction of childhood obesity. The next section will describe the line of inquiry that has investigated parental perceptions of childhood obesity.

Parents Perceptions of Obesity

Parents have substantial influence on the lives of children, particularly in the area of behavior modeling and value development. Research on the role of parent involvement in and

influence on children's academics is significant and contributes to student behavior, success, attendance, and achievement (DePlanty, Coulter-Kern, & Duchane, 2007; Sheldon, 2007). Similar findings in the area of health related behaviors and values depict a sense of urgency for positive physical activity behaviors, nutritional patterns, and wellness choices (Golan & Crow, 2004; Pate et al., 2000; Wofford, 2008). Further, the role of parents as factors that influence childhood obesity may help to reduce the problem. This serves as reasoning for collecting parents' voices perspectives of potential solutions to childhood obesity. Three themes identified in the literature identified below are (a) parents perceptions of childhood obesity, (b) the socio-economic factors influencing these perspectives, and (c) how parents identify schools to be key players in the reduction of childhood obesity.

Parental Perception

In 2000, Myers and Vargas investigated the degree to which parents of obese children accurately perceived their child to be obese. Using an instrument developed for the study, researchers conducted structured interviews with 200 parents at a health center for WIC or Child Health services clinic (95% Hispanic, 1% African American, 1% Caucasian, 0.5% Asian, and 1.5% Indian). The results suggest that 35.5% of parents of obese children did not perceive their child to be obese. Further when asked what they did to control their child's weight, 37% indicated doing nothing while 48% said they restricted high fat and high sugar snacks from their child's diet. Interestingly, only 5% of parents indicated increases in physical activity as a strategy for weight control.

The findings of Myers and Vargus (2000) that parents do not perceive their children to be obese was reinforced by Etelson, Brand, Patrick, and Shirali in their 2003 investigation. Etelson and colleagues developed a survey for this study that assessed parental attitudes about excess

weight in childhood and their perceptions of their own child's weight (2003). Nineteen (23%) of the participants had overweight children between the ages of 4 and 8 years old. Survey results provided researchers with insight that parents of overweight children do not recognize that their child has a weight problem. When asked to indicate on a 'visual analog scale' which required participants to mark on the line between "extremely underweight" and "extremely overweight" only 10.5% of parents with overweight children perceived their child's weight accurately, whereas nearly 60% of parents of normal weight children had accurate perceptions of weight. The consistent underestimation of overweight status highlights a need for intervention programs to address these misconceptions.

Socio-economic factors. In 2000, Gable and Lutz identified potential family activities that put children at risk for obesity. Among these factors were household environment, parenting beliefs, and child characteristics of obese and non-obese children. Their study included 65 parent-child pairs who completed questionnaires that were matched with the children's Body Mass Index. The results suggested that curbing childhood obesity might be achieved through improving parents' knowledge of child nutrition and reducing child television time.

The findings of Gable and Lutz (2000) gained support from Jansen and Brug (2006) who believed that in successfully treating obesity, parents first must be aware of the problem and its accompanying health risks. The results of their study of 1,840 children revealed, however, that 50% of the parents did not recognize that their child was overweight. With the exception of age none of the studied socio-economic factors (e.g., ethnicity, parental education) were associated with parental awareness.

Others have also noted the significance of parental awareness of childhood obesity. Through focus group interviews within a multiethnic community, Bruss and colleagues (2005)

found that factors most influential to health care behaviors were sociocultural, familial, and nutritional messages. Additionally, they found large variation among ethnic groups regarding child feeding beliefs, values, and practices. These findings provide insight to the significance of community health messages regarding obesity within diverse populations.

Noting the significance of understanding how adults, parents in particular, acknowledge obesity prevention was expanded on by Hesketh, Grees, Salmon, and Williams in their 2005 qualitative study with Australian parents and children. Focus group interviews with parents and photo-based activities were conducted with children to elicit the participant's views of social and environmental barriers to healthy behaviors. The behaviors of interest were healthy eating, physical activity and childhood obesity prevention programs, acceptable foci (for the programs), and their views regarding how to best implement the programs. Findings suggested that parents perceived healthy eating to be a primary issue in childhood obesity and suggested increased availability and promotion of healthful food for children as a practical preventative strategy.

Given the considerable control parents have over children's contextual environment (e.g., feeding patterns, food availability) the role parents play in developing children's eating behaviors may be significant. To investigate this Sherry et al (2004) conducted twelve focus group interviews with parents of children between the ages of 2 and 5 years old from varying ethnic and socioeconomic conditions (Caucasian, African-American, Hispanic low-income, and white middle-income). The results from the focus groups indicated that parents felt inclined to provide good nutrition for their children, however participants from all groups admitted to providing sweets as bribes or rewards for specific desired behaviors. Consistent across groups, mothers shared their concerns in using common strategies to promote healthful eating with their children. Further, while variability in attitudes and practices regarding child-feeding patterns was

noted across ethnic and income groups, the authors noted the need for future study to verify the differences among groups.

Perceived role of schools. In 2001, Sahota and colleagues surveyed parents, teachers, and school staff of elementary aged children regarding their views about the "importance of education on nutrition and physical activity and whose responsibility it should be" (p. 2). This assessment was conducted in Leeds, England, prior to the implementation of a school-based obesity intervention. The questionnaire, designed specifically for this study, required adults to respond with their agreement of statements such as "It is important for schools to take a major role in promoting the health of children" (p. 2) of which 92% of parents and 88% of school staff agreed (see Table 2.6). Parents responded to additional statements regarding and their response to potential changes to be made within the school such as "Promotion of healthier break time snacks with enforcement by school" (39% parental agreement) and "Playground activities: organized games and balls, hoops, and skipping ropes to be made available" (34 % parental agreement) (see Table 2.7). The report established that parents in Leeds have identified schools to be environments well suited to implement health and lifestyle behavior interventions aimed at reducing obesity.

Table 2.6

Percentage of School Staff and Parents Who Agreed with Statements Regarding Educating Children about Healthy Lifestyles

	School staff (*n*=124)	Parents (*n*=410)
It is important for schools to take a major role in promoting the health of children	88%	92%
There should be an emphasis on teaching about balanced eating and physical activity in school	94%	94%
School should have a food policy	67%	70%
The family alone should not be responsible for their child's food habits and physical activity	97%	80%
Schools should be responsible for encouraging physical activity	87%	95%
A child's diet affects its health	91%	91%
A child's diet affects its health in adulthood	88%	85%

Note. From "Evaluation of implementation and effect of primary school based intervention to reduce risk factors for obesity" by Sahota, Rudolf, Dixey, Hill, Barth, & Cade 2001, *BMJ, 323, p. 2*

Table 2.7

Percentage of parents who agreed with suggested changes in schools

Suggested Changes	Percentage of Parents (n=410)
Promotion of healthier break time snacks with enforcement by school	39%
Playground activities: organized games and balls, hoops, and skipping ropes to be made available	34%
Healthier school meals	33%
More games and sports and wider variety for all age groups	32%
Ideas for healthier packed lunches	16%
Joining in games and activities and tasting sessions in school	34%
Parents offering skills (dance teachers, food tasting and cooking, sports coaching)	6%

Note. From "Evaluation of implementation and effect of primary school based intervention to reduce risk factors for obesity" by Sahota, Rudolf, Dixey, Hill, Barth, & Cade 2001, *BMJ, 323, p. 2*

In 2005, using open-ended interview questions Trout and Graber interviewed parents of overweight adolescents their perceptions of school-based physical education. Findings from this study indicated that parents strongly endorsed their child's participation in physical education. Reasons noted by participants for their support of physical education included that PE helped

students learn sport specific skills, provided opportunities to engage in physical activity, and enhanced emotional wellbeing. Parental support of physical education programming for the overweight children provides promise to obesity prevention.

Momentum in the area of investigating parent's perceptions of the role of schools in addressing issues of weight was highlighted by Murnan, Price, Tellijohann, Dake, and Boardley (2006). A questionnaire was developed for this study based on the CDC's School Health Index, which focused on components of healthy eating, physical activity, and the school environment. The objective of the questionnaire was to measure parental perceptions of school-based interventions to reduce overweight and obesity in elementary children. Seven hundred questionnaires were mailed to a random sample of parents in Ohio and 344 were returned completed (53.4% response rate). Less than 50% of the respondents indicated that physical education was an important component, whereas 51% of the parents supported limiting access to vending machines that had unhealthy food and beverages. Parents did not support measuring children's body mass index as a strategy to manage overweight in children. While Sahota et al (2001) and Murnan et al (2006) have both developed questionnaires to capture parental perceptions of solutions and strategies to reducing obesity, which is the main objective of the proposed instrument in this study; the primary difference is their limiting solutions to the schools setting.

Similar to Murman and her colleagues (2006), Murphy and Polivka (2007) found that parents perceived the role of schools to be imperative to addressing childhood obesity. Using a modified version of the instrument developed by Price, Desmond, Rupport and Stelzer (1987) the authors sent questionnaires home with parents of children between the ages 5 and 12 years old from after-school programs at eleven different schools. Of the 117 (23%) surveys returned by

parents, the demographic representation was skewed toward tertiary educated (68.1%) Caucasian (87.8%) women (89%). Participants were aware of the complex etiology of obesity and identified physical inactivity and poor eating behaviors as key factors causing obesity in children. When asked to identify weight control strategies for children, participants identified physical education and curricular units on nutrition and weight control. In agreement with Murman et al (2006) these participants supported the elimination of junk food vending machines at schools, but also recommended schools offering low-calorie meals as options within school food service programs. Ultimately, the parents indicated that schools do have or should have a role in childhood obesity prevention and intervention.

The limited inquiry of parents perception of childhood obesity possess a common theme in that parents of obese children inaccurately perceive the obesity of their child (Etelson et al., 2003) and therefore have been noted as impacting the exercise and eating behaviors that are engaged within the parent/child dynamic (Myers & Vargas, 2000). These findings were further epitomized by the consistency across ethnic and economic samples of parents who were unaware of the health risks associated with obesity (Gable & Lutz, 2000). Additionally, what has been learned through these investigations has stimulated scholars to begin seeking parental opinions and perceptions of components of health promotion and obesity prevention programs (Hesketh et al., 2005).

Ultimately, the findings relative to parental perceptions of childhood obesity have implications to the development of future obesity prevention and intervention programs. The implementation of obesity related interventions for children and adolescents have targeted the related factors of obesity in effort to affect the prevalence and incidence of noted adverse health effects of obesity.

Obesity Prevention and Intervention Strategies

It is apparent from the myriad of research highlighting the causes and consequences of childhood obesity that there is a definite need for solutions to this issue to be presented. The fervent continuation of data collection to describe the issue will only contribute to the perpetuation of the problem, and miss the opportunity to apply the evidence and findings of childhood obesity. The 2000 WHO report on obesity asserted that obesity is a global problem and prevention and management strategies applicable to all regions of the world should be developed (WHO, 2000). In response to this notion, researchers and scholars have implemented obesity prevention and interventions in a variety of contexts and addressing a multitude of factors identified as causes. Gutin, Barbeau, and Yin (2004) would argue that a firm understanding of the causes and consequences of obesity in children is imperative. They suggest that having these facts is necessary to assist the development and formulation of "interventions[s] that may help prevent these health problems" (Gutin, Barbeau, & Yin, 2004, p. 121). This sentiment could be described as using empirically based evidence to develop interventions that address particular factors and components known to cause obesity. Essentially, the application of empirically based evidence serves to enhance the body of knowledge in childhood obesity and moves the field closer to an understanding of how to solve this epidemic.

Therefore, the purpose of this section is to provide a discussion of key empirically based obesity prevention and intervention strategies that have been implemented in children and adolescent populations. The intervention strategies will be presented in light of the (a) context/environment, (b) the demographics of the target population, and (c) the specific strategies utilized by the researchers implementing the program. Additionally, the absolute and relative success of the intervention/prevention strategy will be presented along with the noted

limitations of the study. The organization of this section will examine empirically based obesity interventions programs (a) within the school day, (b) outside of the school day, (c) in clinical settings, and (d) involving parents and family members.

Programs Within the School Day

One ideal environment to implement obesity prevention and/or intervention programs is the American public school systems. Nearly 90% of young people in the U.S. attend school, which provides a captive audience and structured time within the regularly scheduled school day to reach young people (United States Census Bureau, 2006). Not all interventions within American schools however are successful. Health and obesity related interventions implemented within the school setting have reported a wide range of successes, with some confounding factors being the expense of time, money, and energy and the challenge of compliance in school administration and parents. Regardless, it appears that scholars are persistent and optimistic with the potential that within the school day obesity prevention/interventions may have. The sheer number of school-based intervention papers published in the physical education, health behavior, is evidence that scholars acknowledge schools suitable environments for lifestyle education and obesity prevention. Scholars have infiltrated all grade levels of public and some private schools, with the greatest prevalence in the middle school.

Elementary school. An obesity intervention program designed by Leupker et al., (1996) and funded in part by the National Heart, Lung, and Blood Institute and the National Institutes of Health was one of the largest elementary school health studies conducted in the United States. The program called the Child and Adolescent Trial for Cardiovascular Health (CATCH) was established to promote healthy eating and physical activity in elementary aged schoolchildren and their families (Leupker et al., 1996). The CATCH intervention was geared at prevention of

cardiovascular disease, and was done so by focusing on the school environment, classroom curricula, and home programs. Twenty-eight schools from four states (California, Louisiana, Minnesota, and Texas) participated in the health behavior intervention which included school food modifications, enhanced physical education curricula, and classroom health curricula. Twenty-eight additional schools received these components plus family education (Leupker et al., 1996). Over the course of a three-year period 5106 3rd grade participants in the CATCH program reported significantly more daily vigorous physical activity than control participants (58.6 minutes vs. 46.5 minutes; P<.003), reduced the amount of caloric intake from fat (32.7% to 30.3%) compared to control schools (32.6% to 32.2%). Data did not support differences in blood pressure, body size, and cholesterol measures between CATCH and control groups. This prevention program, although directed at cardiovascular disease, served to provide positive effects on the daily activity and energy intake of 3rd grade students over a course of three years.

Another experimental study involving 3rd and 4th grade students (N= 192, mean age = 8.9 years) in two elementary schools in San Jose, California participated in a study that measured the effect of the reduction of television viewing (including videotape and video games) on adiposity (Robinson, 1999). Students in the treatment school received six-months (18 lessons) of classroom curriculum aimed to reduce television, videotape, and video game use. The lessons addressed self-monitoring and self-reporting time spent watching television as well as encouraging students to turn off the television and video games for 10 days. Newsletters were sent home to motivate parents to help reduce television, videotape, and video game use. Outcome measures were student television viewing self-report, body mass index, waist circumference, parent recall of children's television viewing. Results identified statistically significant decreases in body mass index of students in the treatment group. In addition, the

findings provided statistically significant decreases in student reported television viewing and meals eaten in front of the television (Robinson, 1999). This intervention provided a unique school to home connect with newsletters and parental reporting.

Middle school. Planet Health, a multi-dimensional intervention targeting middle school students, utilized a classroom-based approach that implemented a health promotion curriculum (Gortmaker et al., 1999). Ten intervention schools in Boston, Massachusetts were selected to take part in the study; five of the schools were then randomly selected to serve as the intervention group, which was provided with the enhanced health curriculum and the others served as a comparison group. Planet Health was designed specifically to "reduce obesity by increasing energy expenditure while promoting key dietary behaviors" (Gortmaker et al., 1999, p. 410).

Students in grades 6-8 (N= 1,295) engaged in the two-year Planet Health curriculum that involved interactive lessons on reducing television viewing time, reducing consumption of high fat foods, increase consumption of fruits and vegetables, and increase moderate and vigorous physical activity. In addition, school-based physical education programs were enhanced with physical activity and inactivity themes, self-assessment of these patterns, individual goal setting, evaluation of low activity patterns, and self-selected moderate and vigorous physical activities. The anthropometric outcome measures of interest were participant's height, weight, and body composition (measured with three site skinfold). Self reported outcome measures were television viewing, physical activity and food intake. Television viewing was assessed through an 11-item Television and Video Measure, physical activity was assessed with a 16-item self report Youth Activity Questionnaire, and dietary intake was assessed using the Youth Food Frequency Questionnaire (Gortmaker et al., 1999).

Results from these measures indicated students in the two-year Planet Health intervention reported significant reductions in obesity (from 23.6% at baseline to 20.3% post intervention) and energy intake among females. No significant changes were reported in intervention males (Gortmaker, 1999). One limitation of this study noted by the authors was the challenge of low participation rates as the schools required written consent from parents; this therefore created a second issue of limited randomization of students by schools. These limitations were accounted for and acknowledge by the researchers, yet remain important to note due to the previously mentioned statement regarding the challenges of school-based interventions.

McKenzie and colleagues undertook another study similar to Planet Health in Southern California in 2004. The intervention titled Middle School Physical Activity and Nutrition (M-SPAN) emulated Planet Health in a two-year time span and involved an enhancement of existing middle school physical education programming. However, several distinct differences prevailed. First, researchers integrating M-SPAN included control schools (N=12) and condition schools (N=12) that had been randomly selected within Southern California. Second, in addition to curriculum materials for physical education classes, M-SPAN researchers also provided staff development for the physical educators and on-site follow-up of the program implementation. During the two-year data collection period, the researchers systematically recorded student activity patterns and lesson content within the physical education classes. Results indicated that participants in the M-SPAN intervention group improved their moderate to vigorous activity during physical education class by approximately 3 minutes per lesson (McKenzie et al., 2004). At the conclusion of the two-year period M-SPAN participants had increased their MVPA by 18% in PE classes with greater effects found in boys (d=.98 *large*) than in girls (d=.68 *medium*) (McKenzie et al., 2004). One might question the impact a meager increase of 3-minutes during

the PE lesson could really make that much of a difference in obesity. A rebuttal to such an inquiry might indicate that evidence provided by the M-SPAN intervention suggest that modifications to physical education content/curriculum/programming and efforts devoted to staff development and support for educators have positive outcomes on student physical activity engagement in PE lessons and coincidently obesity.

Finally, a unique intervention sought to combine traditional causes of obesity with an environmental and technology focused approach. Haerens and colleagues (2006) initiated combining physical activity and healthy food programming with environmental and a computer-tailored strategies for middle school-aged students in 2006. This two-year random controlled trial (RCT) was integrated into middle schools in aims to decrease body mass index of the participating students in the intervention groups. In addition, another goal of the program was to "help children create a physically active lifestyle, together with a healthy diet" (p. 849). The physical activity intervention consisted of encouraging the schools to provide more opportunities to be physically active during the school day (e.g., active breaks at noon, or after school).

These efforts generated an average of 4.7hours (± 2.66) of extra physical activities during school hours. One method that assisted in accomplishing this was that schools received equipment and sports materials in order to promote the organization of for non-competitive physical activities for students. Physical fitness measures were assessed on participants and based on their individual results, participants were provided with an individualized computer-tailored physical activity and wellness program. Participants completed the International Physical Activity Questionnaire (IPAQ) to assess habitual physical activity patterns.

The second component of this intervention focused on dietary habits, which was initiated by selling fruit and water at low prices at school during breaks, and providing students with a

free water bottle. The schools also posted information about eating healthy snacks and drinks around the school building (Haerens et al., 2006). The third and final component of this intervention included parental involvement. The efforts of the researchers to include family and parents in this movement consisted of interactive meetings on healthy food, physical activity and the relationship between health and overweight. Furthermore, newsletters and a free CDROM were sent to parents to support this campaign and encourage family education and awareness. Findings provided that parental support of an intervention's elements (i.e., physical activity and healthy eating) resulted in positive outcomes of body mass index in middle school-aged participants (Haerens et al.,2006).

High school. In the mid 1980s, scholars in Minnesota and North Dakota initiated a four-year quasi-experimental study with students in grades 8-12 (*N*= 1342) that experimented with a school and community-based intervention targeting healthy behaviors in young people (Kelder, Perry & Klepp, 1993). The study had two primary components geared toward the high school aged students. The first of the two components involved a community-wide competition to increase physical activity outside of physical education titled Fargo/Moorhead-250 (FM-250). The four-week challenge encouraged 8th grade students to make "special effort to exercise outside of school the equivalent of bicycling 250 miles, the distance from the intervention community to Minneapolis" (p. 219).

The second of the two components was a peer-led healthy eating curriculum called Slice of Life (Kelder et al., 1993). Slice of Life was designed to increase awareness of nutrition and physical activity, raise the value of health, and provide opportunities to increase locus of control. Both of the components were geared toward positive social influence and healthy behavior reinforcement (Kelder et al., 1993). Throughout the four-year study, participants annually

completed self-report measures of physical activity (recording hours of exercise per week out of class). At the conclusion of the complex/involved study, grade 12 females in the intervention group reported exercising 78 minutes longer (outside of physical education) than the female participants in the comparison community. Further, results indicated that at all age groups participants in the intervention community participated in greater amounts of physical activity per week (outside of PE), but were not statistically significant at all points. This study is particularly unique due to the limited number of studies conducted in a randomized and longitudinal design. Further, the complexity of the design, which integrated community members and the peer-led curriculum, emphasized the social support component of exercise and physical activity. However, regardless of these promising effects of such methods, few scholars have attempted to replicate these strategies in current literature- possibly due to cost, community accessibility, and or limitations in measurement reliability (Kelder et al., 1993).

Another obesity prevention experimental study included forty-four girls (ages 15-17 years) enrolled in a 5-day per week anatomy class for 5 weeks and were randomly assigned to control (n=22) and training groups (Eliakim et al., 1996). This study presented a dual method of intervention. First, all participants (N= 44) engaged in daily 2-hour classroom session providing content and lessons on anatomy. The participants in the training group then participated in daily endurance-type training, while the control group participants underwent a computer workshop. Outcome measures of this study assessed total energy expenditure, thigh muscle volume, and maximal oxygen uptake. After the 5-week intervention, results identified total energy expenditure was significantly greater (15.3%) for training group. Additional positive outcomes for the endurance training group was greater increases in thigh muscle than control group participants who engaged in the computer class.

Programs Outside the School Day

Another option that researchers and scholars have taken hold of is the implementation of obesity prevention and intervention strategies outside of the school day and in environments frequented by young people. For example, churches, local health clubs (i.e., YMCA), and local recreational centers. The accessibility to young people appears to be greater in these environments, as consent from administration is often less rigid than in educational settings. Also, these environments continue to provide a captive audience and a sense of structure and normality for children and adolescents. Drawbacks may include issues such as diversity in sample may not be representative of population group and limitations of attendance requirements of participation (i.e., greater attrition rates possible for participants who are "voluntarily" at the YMCA or church, etc). Two obesity prevention programs implemented outside of the school day will be presented below.

One extensive program targeted enhancing after school play in 7-11 year old boys. Gutin, Riggs, Ferguson, and Owen (1999) provided transportation to and from the intervention site for participants in a 4-month period. During the intervention session, the participants were required to participate in forced playtime with other participants- this included playing sport-like games such as football, soccer, and other like games. At the beginning of the intervention period, participants' body fat percentages were recorded using height and weight measurements to calculate body mass index (BMI). At the conclusion of the 4-month intervention period, the percentage of fat in participants who engaged in forced play had reduced significantly (Gutin et al., 1999).

Begyn, Gayle, and Schiltz (2003) conducted a five week-summer extended physical education (PE) course with 10th grade students designed to investigate the effect physical activity

during PE had on high school PE students. As a part of the intervention, four-hour PE classes were embedded in the daily routine of the high school aged participants (*N*=28). During the PE class time four different physical activities were presented (one hour each activity). The results revealed an average of 1.3% fat loss for all participants within the sample. There was a small, but significant difference between the participants who at the beginning of the intervention had over fifty-percent body fat at the pre-test; for this sample of participants, an average of 1.7% fat loss was calculated. This outside of the regular school day study was intended to investigate the impact of extended PE class periods on the body composition of 10th grade students. Because of this study, the authors indicated that block scheduling at the high school level in PE could stand to have an impact on adolescent obesity (Begyn et al., 2003).

Programs Based in Clinical Settings

Another environmental arena for obesity prevention strategies often cited in relevant literature is clinical and outpatient settings. Within the clinical setting, there is often a greater level of control for external/extraneous factors influencing. There might perhaps be a greater degree of randomization of participants into grouping of intervention and control. Clinically based obesity studies rarely focus on generating population-based guidelines or thresholds, and more regularly address special populations of individuals (i.e., participants with pre-existing conditions – obesity, diabetes, etc).

A clinical investigation of the effect of a 10-week supervised physical training intervention on overweight girls revealed positive effects on body composition measures (Gutin, Cucuzzo et al., 1995). Participants were 25 obese African American girls aged 7-11 years old. Twelve girls participated in 5 days/week supervised aerobic activities and ten girls participated in weekly lifestyle education without physical training. Baseline and end measures of body

composition were collected for participants in both groups. Results indicated that female participants showed significant increases in cardiovascular fitness and a significant decline of body fat (1.4%) (Gutin, Cucuzzo et al., 1995). Whereas participants in the lifestyle education group declined dietary energy and the percent of energy consumed from fat (Gutin, Cucuzzo et al., 1995). The authors concluded that controlled aerobic training had positive health effects on improved fitness and body composition in African American girls. What's more, the lifestyle education group also provided indications of positive change in dietary behaviors- which are worth noting and important components of obesity reduction.

Epstein, Paluch, Gordy and Dorn (2000) undertook a comprehensive family-based weight control program involving dietary and behavior changes. Ninety families with obese 8-12 year old children were selected to participate in this longitudinal clinical investigation. All families took part in the dietary segment of the intervention, but families were randomly assigned to behavior change targets, either a) reducing sedentary behaviors or b) increasing physical activities. During the first 6-month period, families participated in 16 weekly meetings where materials were distributed and measurements were collected. Baseline measures were taken of the following components: height, weight, body mass index (BMI), maximum oxygen uptake (VO2 max), workload and physical activity analysis questionnaires; and then again at 6-, 12-, and 24-month intervals. Results of these family efforts indicated that families in the activity-targeted groups showed statistically significant ($p<.05$) increased their active time from baseline to 24 months and the sedentary-targeted groups showed statistically significant ($p<.001$)decreases in their sedentary time from baseline to 6 months and significant ($p<.05$) from baseline to 24 months. Overall, obese parents decreased body weight by 7.8% during the time of

the intervention (Epstein et al., 2000). Significant body weight changes in obese children were found only when sedentary behaviors had decreased by at least 20 hours/week.

Some research has been done that suggests that obese children may have decreased bone strength compared to their non-obese peers (Nemet, Berger-Shemesh, Wolach, & Eliakim, 2006). A three month combined dietary-physical activity intervention was initiated to compare 12 obese children with gender-age matched controls. Anthropometric measures including weight, BMI, percent body fat, endurance time, and bone strength were collected from the participants. An outcome of the intervention revealed significant differences in changes of body weight, BMI, body fat percentages, and endurance time (Nemet et al., 2006).

In 2007, overweight children who had participated in a one-year outpatient program involving physical exercise, nutritional education, and behavior therapy reported significant changes in body mass index as a result of the program. The "Obeldicks" intervention included 170 U.S. children. At the conclusion of the one-year outpatient program 77% of the participants had reported a reduction in BMI and then again at the three-year follow up 66% had sustained reductions in BMI from the baseline measures (Reinehr et al., 2007).

Parent and Family-Based Programs

Obesity intervention programs that engage parents, siblings or family members have been identified as effective in sustaining long-term weight loss (Israel, Guile, Baker, & Silverman, 1994), improving food choice and selection (Birch & Davison, 2001; Epstein et al., 2001), and enhancing health-related behaviors (Müller, Asbeck, Mast, Langnäse, & Grund, 2001). One explanation for the influence parents and family have on obesity in children is the degree of reliance children have on parents and caregivers to "purchase food items and to provide …transportation to physical activity programs" (Pate et al., 2000, p. S143). Further, the

social environment within the home has explicit influence on the lifestyle choices, behavior modeling and value development (Stolley & Fitzgibbon, 1997). The main theme within the literature of parent and family-based programs that appears to influence childhood obesity is the involvement of parents and family members in specific obesity reduction efforts.

Parent and family involvement. Researchers in the area of obesity interventions have identified parents and caregivers as having an important role in the development of overweight and obesity in children (Etelson, Brand, Patrick, & Shirali, 2003; Golan & Crow, 2004; Golan, Weizman, Apter, & Fainaru, 1998; Pate, Trost, Mullis, Sallis, Wechsler, & Brown, 2000; Wofford, 2008) and therefore have begun to include parents and family-based interventions in their literature addressing notable strategies. The involvement of parents and family in obesity intervention programs implies either direct or indirect participation of these individuals in specific obesity reduction programs.

For example, in 1982, Brownell and Kaye identified and targeted various social and educational factors that influenced overweight children within the school setting. The researchers viewed parents as integral in providing a positive social environment for children in the intervention group. Therefore, parents became participants in the study and engaged in a program that taught them the importance of exercise, were given strategies to increase physical activity and were provided with tactics to help their child set realistic weight loss and behavior modification goals (Brownell & Kaye, 1982). Of the sixty-three overweight schoolchildren (5-12 years old) who participated in the 10-week behavior modification (physical activity and nutrition education) intervention that emphasized positive social support, 95% of them reversed their steady weight gain and lost an average of 4.4kg (Brownell & Kaye, 1982). The authors noted the

significance of social support and emphasized the necessity of parental support in future programs targeting child weight control

A longitudinal investigation by Epstein, Valoski, Wing, and McCurley (1990) supported the findings of Brownell and Kaye (1982). Epstein et al (1990) designed a ten-year intervention program that examined the effect of reinforcement of weight loss and behavior change growth and overweight status of obese children. Participants included obese children aged 6-12 years old and their parents, who were placed into three randomized groups (1 children only and 2 children and parent groups). All three groups received the same diet, exercise, and behavior management training with the independent variable being the provided reinforcement. One children and parent group served as the control, receiving reinforcement only for attendance to the program, whereas the remaining groups served as the treatment and received reinforcement for weight loss and behavior change. After ten-years of the intervention, data established significant decreases in overweight percentage of children (-11.2% after 5 years and -7.5% after 10 years) in the children and parent treatment group, whereas children in the children only treatment group experienced increased percentages of overweight (+2.7% after 5 years and +4.5% after 10 years). These stated findings imply parental involvement in behavior change programming is significant in the reduction of obesity in young children over long periods.

Another program focused the inclusion of the entire family in the reduction of children's obesity (Flodmark, Ohlsson, Rydén, & Syeger, 1993). Flodmark and colleagues established a family-based therapy focused intervention that aimed to create and enhance a supportive emotional atmosphere within families. Forty-four obese children (10-11 years old) participated in dietary counseling and medical screening for a period of 14-18 months. Half of the participants were randomly selected to also engage in family-based therapy sessions (5-10 sessions). The

therapy was directed to help families identify the resources available to "create an optimal emotional climate for helping the obese" children lose weight (Flodmark et al., 1993, p 881) while also focusing on family values and belief systems to promote respect and. solutions to obesity. Anthropometric measures (BMI) were collected from all study participants during the medical screening sessions. After a year, participants who engaged in the family-based therapy group indicated significantly lower BMI measures as well as significantly greater physical fitness measures than control group participants. These findings advocate for family therapy as an effective strategy to "prevent the development of severe obesity during childhood" (p. 883).

In 2001, Epstein and colleagues took a parent-focused approach of improving family dietary behaviors as a strategy of reducing childhood obesity. The researchers targeted families (*N*= 30 families) with obese parents and non-obese children (6-11 years old) as participants in their yearlong dietary behavior modification program. Participating families were randomly placed into one of two target behavior groups, the groups included: increase fruit and vegetable intake or decrease high-fat/high sugar food intake. Baseline and follow-up measures were collected from participating families of anthropometric (BMI), family history of obesity (parents only), food intake (Food Habits Questionnaire), and psychological measures (Child Feeding Questionnaire, parents only). Throughout the yearlong intervention, families attended educational sessions focused on targeted behaviors. Data at follow-up indicated that parents and children within the fruit and vegetable group improved their targeted behaviors while also decreasing their consumption of high-fat and high-sugar foods. Additionally, throughout the intervention children within the fruit and vegetable group "showed trends toward greater increases in fruits and vegetable[s]" (Epstein et al., 2001, p. 176) and increased their "intake of nutritionally dense healthy foods" (p. 176). As a result, the authors concluded that environments

that targeted weight control of parents through increasing fruit and vegetable intake, have positive implications for children.

While the link between parent and family-based obesity prevention programs offers potential in curbing childhood obesity, an important element that may influence parental involvement is the parent's attitude toward and support of specific prevention strategies. Müller, Asbeck, Mast, Langnäse, and Grund (2001) conducted a study that advocated nutrition and health promotion education to parents and families of overweight children to enhance parental support of weight reduction. Their findings concurred with Brownell and Kaye (1982) that social support from parents was a promising strategy for reducing childhood obesity. Müller et al (2001) implemented the Kiel Obesity Prevention Study (KOPS) from 1996 to 1999 that provided behavioral and educational messages related to diet, physical activity, and television viewing to children (aged 5-7 years old) and their parents. Another component of the intervention included family-based counseling that involved home visits by a nutritionist to encourage the monitoring of food intake and activity participation of children. Further, parents were provided with healthful shopping, cooking, and snacking choices. Researchers found that after a year of the intervention, participants in the treatment group had significantly smaller increases in the percentage of fat mass in overweight children compared to the control group (increase by 0.4% vs. 3.6%). Further, the authors noted the potential impact that combining school and family-based programs may have on the short-term heath-related behaviors of young children.

Summary

Collectively, scholars have applied the empirical evidence of the causes and consequences of obesity within programs designed to curb the epidemic. Research designs have varied the combinations of risk factors and outcome measures employed within multiple

populations and environments. The literature has indicated that effective school and clinical-based interventions have extended into the homes and communities of children to address behavioral and social factors associated with obesity. The involvement of parents and family members in the programs design appears to be a valuable component to increase healthful behaviors, motivation, and sustainability of positive health outcomes in children.

Nationally Coordinated Obesity-Related Initiatives

National and internationally coordinated organizations such as the Center for Disease Control and Prevention (CDC), the Institute of Medicine (IOM), and the World Health Organization (WHO) have made significant contributions to the study of obesity and the development of obesity-related intervention program. Research conducted through these recognized institutions has provided a substantial body of literature relevant to childhood obesity, often cited in publications such as *Mortality and Morbidity Weekly Report, Circulation,* the National Academies Press website, the *Bulletin of the World Health Organization.* Further, national health reports by the Surgeon General (USDHHS, 1996) and directives from Congress have launched the establishment of programs such as *Healthy People 2010* (CDC, 2000), and `*Preventing Childhood Obesity: Health in the Balance* (IOM, 2004). These two initiatives will be briefly discussed as fundamental to the conceptual organization and development of the proposed survey instrument.

Healthy People Initiative

The mission of the CDC is "to collaborate to create the expertise, information, and tools that people and communities need to protect their health…" (Center for Disease Control and Prevention, 2008, ¶ 1). This sentiment has guided research and established health and quality of life promotion initiatives for Americans. One for instance, is the *Healthy People* initiative that

was established in 1980 in response to the 1979 Surgeon General's Report. The initial launch was entitled *Promoting Health/Preventing Disease: Objectives for the Nation* (National Center for Health Statistics [NCHS], 2001) which generated a prevention-based national agenda. From its origins, the aim of this initiative has been to increase the quality of healthy life and eliminate health disparities among citizens of the United States.

Revised editions of the original 1980 document in 1990 and 2000 have established *Healthy People 2000* and *Healthy People 2010*. The two most recent documents provide measurable targets of the objectives based on empirical nationwide data while identifying both baseline data and progress made toward the projected year's goal. Noted in the foreword of the *Healthy People 2000* Final Report, Edward J. Sondik the Director of the National Center for Health Statistics stated: "the ability to quantify and assess progress on health objectives is at the heart of the Healthy People initiative" (National Center for Health Statistics, 2001, p. iv). The quantifiable goals of the *Healthy People* initiative are 1) increasing quality and years of healthy life and 2) eliminating health disparities.

` One primary health disparity targeted by the *Healthy People* initiative is childhood obesity. This is evident in recognition of overweight and obesity as a leading health indicator, second to physical activity, in the *Healthy People* documents. Field experts have written over 140 specific health objectives that describe targeted populations and behaviors (i.e., "Objective 1-1: People with disabilities under age 65 who have health insurance"). Quantitative baseline data are then collected from the target populations and used to formulate measurable target goals for the specific behaviors. Relative to childhood obesity, the *Healthy People* document has noted five focus areas (see Table 2.8) and related objectives to address obesity specifically in childhood (see Appendix A). Due to the collective nature of the development of the childhood

obesity related focus areas and objective, it is proposed that these five areas serve as a preliminary framework in the development of the proposed survey instrument.

Table 2.8

Focus Areas Addressing Childhood Obesity in Healthy People 2010

1. Access to quality health services
2. Educational and community-based programs
3. Environmental health
4. Nutrition and overweight
5. Physical activity and fitness

Institute of Medicine Sponsor Varied Social Level Approach

Collaboration among agents at varying social levels has been identified as a practical approach to preventing childhood obesity. Established by the National Academies in the 1970s, the Institute of Medicine (IOM) strives to produce "authoritative, objective, and scientifically balanced answers to difficult questions of national importance" (National Academy of Sciences, 2008, ¶ 1). The structure of the IOM provides the investigation of multiple topic areas such as Global Health, Child Health, Workplace Health, and Public Health and Prevention, among others. Within the Public Health and Prevention, projects linked to chronic and preventative diseases are considered; it is within this area that childhood obesity prevention initiatives, such as *Health in the Balance,* have been established.

In 2002, the IOM was charged by Congress to develop a prevention-focused action plan to reduce the obesity in children and youth in the United States (IOM, 2005). From this,

stemmed a committee of "national leaders in public health, public policy, medicine, nutrition, physical activity, pediatrics, obesity prevention, social and behavioral sciences, biostatistics and epidemiology" (IOM, 2008, ¶2) to stimulate discussion and action toward reducing obesity in children. In 2004, the committee published their action plan titled *Preventing Childhood Obesity: Health in the Balance*, which emphasized behavioral, social, cultural and environmental actions for obesity prevention (IOM, 2004). This report established obesity prevention as a national priority and proceeded to identify a list of "Immediate Steps for Confronting the Epidemic" (see Appendix B) by implementing the role and responsibilities of agents at all social levels (i.e., federal government, industry and media, state and local governments, health care professionals, etc.).

These noted social levels within the *Health in the Balance* initiative align with the reputable Ecological Systems Theory (Brofenbrenner, 1979), known more commonly as the Social Ecological Model (SE Model). This concept establishes that an individual's health behaviors, attitude, and identity are influenced through an interaction of various layers of social components. The SE Model dimensions begin with an individual's attitudes, beliefs, and values and expand outward to the overarching laws, regulations enforced by government. The five dimensions include: a) Individual, b) Interpersonal/Lifestyle Influences, c) Institutional/ Organizational, d) Community, and e) Social Structure/Policy. It is proposed that factors within each of these layers serve to influence and impact an individual's behaviors and values.

This approach appears to be well suited for the organization of obesity prevention tactics and strategies, as the range of social levels clearly depict influence on the individual through constant interaction among the five levels. Also, as the IOM's list of "Immediate Steps for Confronting the Epidemic" presents potential strategies within each level the expansive nature of

health awareness and obesity prevention becomes more prevalent as a social issue more so, or as much so, as an individual issue. It is with this frame of mind that the utilization of the Social Ecological Model as an organizational plan be coupled with the obesity prevention strategies categorized within the CDC's *Healthy People* initiative, with the goal in mind of identifying the content AND the social context in which parents perceive to be valuable and necessary approaches to combating childhood obesity.

Summary

The purpose of this study is to develop and validate a survey instrument that will measure parent perceptions of solutions to childhood obesity. In order to address pertinent factors of this study, a review of literature was executed to concentrate the known components and pre-existing efforts employed to curb childhood obesity. The literature clearly suggests that childhood obesity has become a global epidemic (WHO, 2004) with large economic burden (Caterson, Franklin, & Colditz, 2004; Thompson & Wolf, 2001) and negative influence on the health of Americans (Daniels et al., 2005; Paradis et al., 2004; Weiss et al., 2004). Scholars have advocated for and conducted research to depict the risk factors associated with obesity in children and adolescents, revealing a dynamic etiology of the disease with interacting factors such as physical inactivity and poor nutrition (Vermorel et al., 2005).

In efforts to curb the prevalence of childhood obesity, multifaceted prevention programs have been implemented within school, community, family, and medical settings. Efforts within these settings have addressed a variety of the empirically based risk factors and health outcomes of obesity (Gortmaker et al., 1999; Leupker et al., 1996; McKenzie et al., 2004). The involvement and support of parents and family members within the aforementioned prevention programs have proven significant on healthful eating behaviors, weight reduction, and the

sustainability of the programs (Epstein et al., 2001; Müller et al., 2001). While parental involvement has been established as a crucial intervention element (Golan & Crow, 2004; Pate et al., 2000; Wofford, 2008) few intervention studies have sought to capture parent's views on program components prior to implementation. While some scholars have gathered parents opinion of the role of schools in obesity reduction (Murnan et al., 2006; Murphy & Polvika, 2007; Sahota et al., 2001), few have captured parents perceptions of solutions outside of schools (Covic et al., 2007). Moreover, at this point, there are no valid and reliable instruments that measure parent's perceptions of solutions to childhood obesity. Therefore, this study will utilize a model developed by Benson and Clark (1982) and two nationally recognized initiatives as the foundation for constructing a valid and reliable instrument that will capture parent's perceptions of obesity prevention strategies for children and adolescents.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

The purpose of this study is to develop and provide preliminary validity for a survey instrument that will measure parental perception of potential solutions for childhood obesity. Specifically, this study is to develop a survey instrument to identify potential and practical solutions to childhood obesity. During the development of the instrument, a multiple stage repeating process will be used. Additionally, during the development of the questionnaire, empirical evidence will be obtained for the purpose of investigating the validity of the measurement. A four-phase process of (a) planning, (b) item construction, (c) quantitative evaluation, and (d) validation as suggested by Benson and Clark (1982) will guide the process.

The organization of this chapter and subsequent execution of this study will correspond with the phases described by Benson and Clark (1982). To begin, however, a description of seminal works in the area of psychometrics will set the stage, inform the critical elements of instrument construction, and explore the discourse of validation of survey instruments. Benson and Clark (1982) embed these foundational components of measurement theory described in the model proposed. Therefore, the remainder of this chapter will be organized to provide a thorough description of the phases described by Benson and Clark that will guide this research. The four phases are as follows: (a) planning, (b) item construction, (c) quantitative evaluation, and (d) validation.

Instrument Development

Instrument construction is founded in the field of psychometrics and possesses a rich theoretical history. Discourse in psychometrics has served to generate guidelines for objective instrument development and purports a systematic process in test development and validation

(APA, AERA, NCME, 1954). A brief history of the principles of instrument construction including landmark studies relative to instrument development will be presented. Additionally, a discussion of the primary elements of a psychometrically sound instrument will be outlined within this section. In closing, a brief navigation of literature describing the necessity of instrument validation as a component of instrument development will be presented.

History of Principles of Instrument Construction

A standardized psychological test construction procedure was established in 1954 with the publication of the *Standards for Education and Psychological Tests* (American Psychological Association [APA], American Educational Research Association [AERA], and the National Council on Measurement in Education [NCME], 1999). The development of the *Standards* was an inaugural step in distinguishing clear guidelines of psychometrically sound test construction and necessitating sophisticated methods of generating evidence of test usefulness (Allen & Yen, 1979). Allen and Yen (1979) further speculated that a foundational sentiment established by the *Standards* was that "every test user [administrator] has the obligation to demonstrate that the tests he or she uses are the best instruments and methods available for rational, objective decision making" (p 142). Accordingly, the *Standards* (see Table 3.1) identified *six* requirements of test developers and responsibilities of test users, to guide and essentially provide essentially a quality control for newly constructed instruments.

Table 3.1

Standards for Education and Psychological Tests

1. Clear discussion of intended purposes and applications, with supporting evidence for each claim,
2. Summaries of the test-development procedures, rationale, and item analyses, with a clear distinction between preliminary results and results obtained with the test in final or revised form,
3. Clearly defined norm groups and information about how they were obtained,
4. A discussion of the reliability and validity of the test and subpart scores, together this information describes how these statistics were obtained,
5. Clear instructions for test administration and scoring, including required qualifications for test administrator and interpreter,
6. Information necessary for correct interpretation of test scores and warnings about foreseeable misuses, and a discussion of the variables known to affect test scores or their reliability or validity (for examples, regional, race, creed, or sex differences and differences due to different answer sheets or alternative forms of the test).

Note. From American Psychological Association, American Educational Research Association, and the National Council on Measurement in Education (1974). *Standards for Education and Psychological Tests.* Washington, DC

The development of a useful survey instrument that is recognized as a valid and reliable measure of its constructs requires the adherence of several established principles (APA, AERA, NCME, 1999; de Leeuw, Hox, & Dillman, 2008; Dillman, 2000). Scholars in the field of

psychometrics (de Leeuw et al., 2008) have acknowledged instrument development as encompassing both conceptual and empirical processes. The conceptual processes serve to establish the purpose and objectives of the instrument, define the theoretical concepts to be measured by the instrument and establish validity of noted constructs (Benson & Clark, 1982; Clark & Watson, 1995; de Leeux et al., 2008). Concurrently, the empirical efforts essential to the development of quality instruments include, but are not limited to, continual investigations of validity and reliability of test items (item analysis), structural validity, and internal consistency of the measure (APA, AERA, & NCME, 1999; Benson & Clark, 1982; Clark & Watson, 1995; de Leeux et al., 2008).

Instrument Validation: A Vital Component of the Process

The acknowledgement of questionnaires as a legitimate method of assessing psychological traits (APA, AERA, & NCME, 1954) has stimulated construction of a multitude of survey instruments by independent scholars and professional organizations. In 1999, the Buros Institute published an archive of published questionnaires and surveys, which totaled approximately 40,000 different instruments (Murphy, Impara, & Plake, 1999). An evaluation of the quality or "psychometrical soundness" (Cohen & Swerdlik, 2002, p. 28) of a measure requires two key aspects: (a) reliability and (b) validity (Aiken, 1997; Allen & Yen, 1979; Cohen & Swerdlik, 2002; Clark & Watson, 1995; de Leeuw et al., 2008; Messick, 1995).

Reliability. In theory, a perfectly reliable instrument consistently measures the content and constructs put forth by the test developers (Cohen & Swerdlik, 2002). The reliability of a measure has been defined to as "the consistency or repeatability of a measure" (Thomas & Nelson, 1996, p. 220) while reliability measures often take into account different sources of measurement and sampling error (Aiken, 1997). The reliability of an instrument is often a first

step in determining the validity of a measure (Thomas & Nelson, 1996). The degree of reliability is expressed in three domains: (a) stability, (b) alternative forms, and (c) internal consistency (Cohen & Swerdlik, 2002; Thomas & Nelson, 1996). In this study stability coefficient will be measured using test-retest reliability (Allen & Yen, 1979) and the internal consistency coefficient will be measured using Cronbach's coefficient alpha (Aiken, 1997).

Validity. As noted previously, validity of an instrument is a critical element of mental measures. A traditional definition of validity is the judgment of how well a test or other measurement instrument in fact measures what it purports to measure (Cohen & Swerdlik, 2002). The indispensability of a testing instrument's validity begins during instrument development process, and then is considered continuous from that point (Kaplan, 1964). In addition, Messick, a leading scholar noted that instrument validity as an overall "justification for test interpretation and use" of an instrument (Messick, 1980, p. 1014). Scholars agree that validity of measures is critical to mental measures, but at least since the 1950's scholars and measurement theorists have debated philosophical issues revolving around instrument/test validation (Cohen & Swerdlik, 2002).

The seminal work established jointly by the American Psychological Association, American Education Research Association, and the National Council for Measurements Used in Education in 1954 was titled "Technical Recommendations for Psychological Tests and Diagnostic Techniques" (APA, AERA, & NCME, 1954). Within this document, three terms of validity were identified: (a) content validity, (b) criterion-related validity, and (c) construct validity. The combination of these validity concepts were meant to work in concert to establish a unified framework for instruments and psychological tests.

Since this publication, however, scholars have interpreted the three components as separate entities and by doing so created "a conceptual compartmentalization of 'types' of validity… [that] leads to confusion and, in the face of confusion, oversimplification" (Dunnette & Borman, 1979, p. 483). This school of thought depicts the seeking of various *types* of validity as inadequate for providing predictive qualities of an instrument. In other words, if one type of validity (content validity for example) were determined for an instrument, the assumption that the validation process of the instrument was complete would be recognized as insufficient. Messick (1975) and Guion (1980) acknowledged this disjointedness of validity and called for a unitary view of validity. Messick (1995) further encouraged scholars to consider the many components of validity and challenged the interpretation of everything "from the implications of test scores in terms of societal values to the consequences of test use" (Cohen & Swerdlik, 2002, p. 155).

To further this point, scholars claimed and supported that the validity of an instrument required a collective understanding of the "*meaning* of the measure" (Messick, 1975, p. 956) in order to best "appraise potential social consequences sensibly" (Kaplan, 1964; Messick, 1975, p. 956; Messick, 1980). A leading scholar in the field noted that validity requires an interpretation of the scores to understand their meaning, as well as the implications for action that this meaning entails (Cronbach, 1971). In other words, greater emphasis is placed on the meaningfulness of a test score or results from a measure. This approach emphasizes psychological assessment to a greater degree (measures of attitude, value, and beliefs). In 1980, Messick stated that validity itself is the overall "justification for test interpretation and use" of an instrument (p. 1014). He argued that reducing validity down to *types*, which are essentially processes that produce facts and numbers, in effect reduced the value of interpretations of the evidence produced by a

measure. From this stance, Messick (1995) advocated for a "unified" view of validity that takes into consideration of the social contexts and consequences of the utility of an instrument.

Model Proposed by Benson and Clark

Instrument development has been outlined by scholars in the field of measurement as a primary method of collecting psychological information from large populations of people, further the purpose of surveying the masses aids in the elicitation/and proliferation of public knowledge and opinions. The basics of instrument development have been described by Loevinger (1965), Allen and Yen (1979), and Benson and Clark (1982). Of these, the framework provided by Benson and Clark (1982) apply the conventions of the elements founded in the *Standards for Education and Psychological Testing* (APA, AERA, & NCME, 1999). Further, it has provided a blueprint for the development of valid and reliable instruments (Body Self-Image Questionnaire [BSIQ], Rowe, Benson & Baumgartner, 1999; Children's Test Anxiety Scale [CTAS], Wren & Benson, 2004; Emotional Regulation during Test-taking [ERT], Schutz, Distefano, Benson, & Davis, 2004; Test Emotions Questionnaire [TEQ], Pekrun, Goetz, Perry, Kramer, Hochstadt, & Molfenter, 2004). For this reason, the aforementioned model by Benson and Clark (1982) outlined by a four-phase process, founded in measurement theory and ideology has been selected to provide a sound progression and guide for the development of the new survey instrument to measure parent's perceptions of solutions to childhood obesity.

The Benson and Clark (1982) model describes a four-phase method of development of a valid and reliable instrument that includes: (a) planning, (b) item construction, (c) quantitative evaluation, and (d) validation. The model requires replication of particular stages (i.e., multiple pilot studies and factor analyses) in order to generate a psychometrically sound instrument. Initially intended for occupational therapists, Benson and Clark (1982) published this model as a

guide to enable scholars "to construct valid and reliable assessments capable of yielding data of scientific value" (p. 790). The model had provided a systematic guide for instrument development and validation of previously noted instruments. An overview of the four-phase and associated steps of Benson and Clark's (1982) instrument development and validation process will be described (see Figure 3.1).

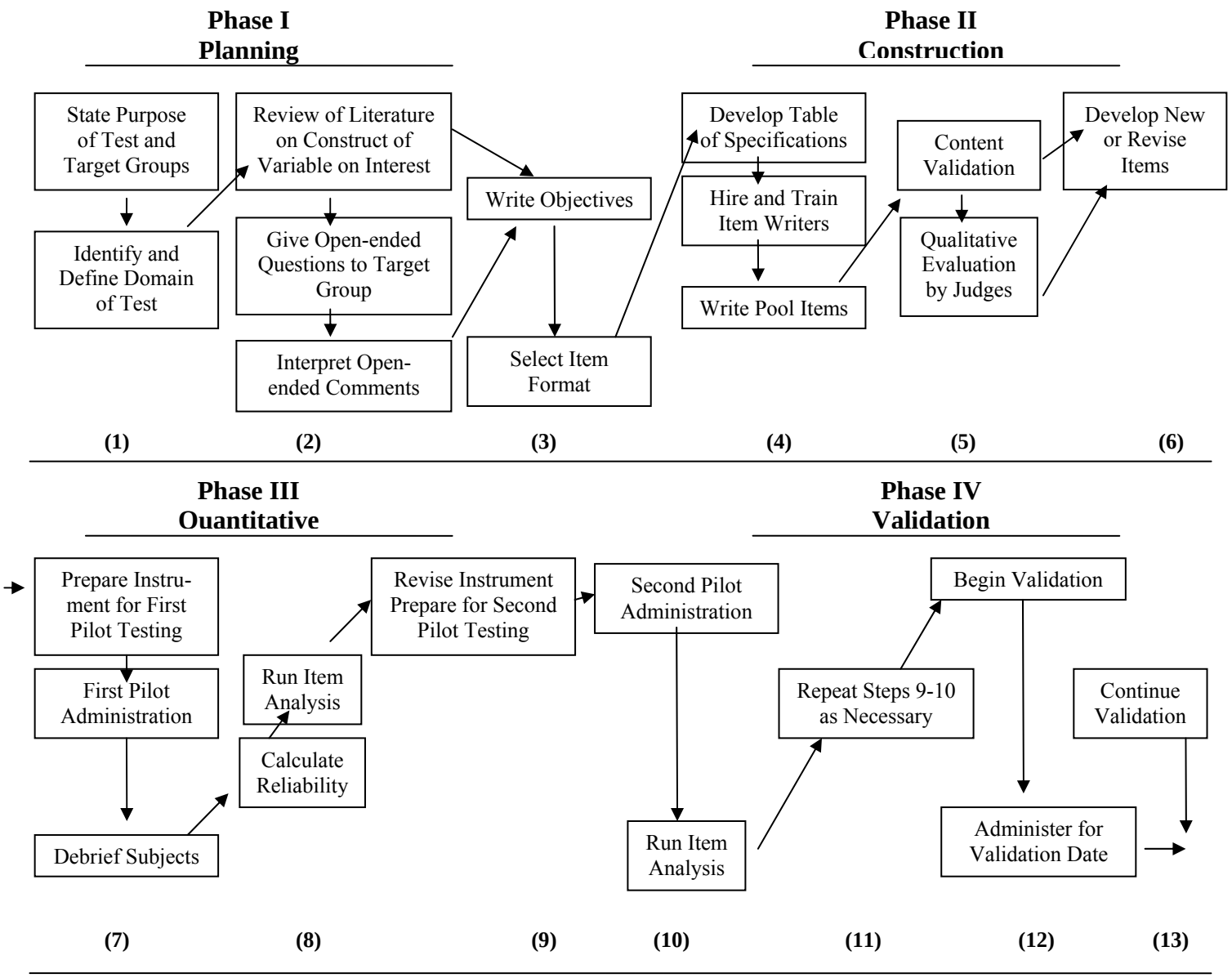

Figure 3.1. Flowchart of Instrument Development

Note. From "A Guide for Instrument Development and Validation", Benson and Clark, 1982, *The American Journal of Occupational Therapy, 36*(12), p. 790. Reproduced

Phase I: Planning

To overview, the Planning Phase as suggested by Benson and Clark (1982), the steps proposed to complete this phase will be discussed within this section. The completion of this phase resulted in a clear purpose statement for the instrument; open-ended questions for pilot study participants will be developed; open-ended questions will be administered and analyzed. Table 3.2 identifies the steps undertaken to complete this phase.

Table 3.2

Phase I- Planning

Step 1	State Purpose of Test and Target Groups
• Step 1a	• Identify and Define Domain of Test
Step 2	Review of Literature
• Step 2a	• Give Open-ended questions to target group
• Step 2b	• Interpret open-ended comments

The Planning Phase initialized the conceptual process (de Leeuw et al., 2008) of instrument development, which establishes the conceptual foundation that epitomized the proposed survey instrument (AERA, APA, & NCME, 1999; Benson & Clark, 1982; Clark & Watson, 1995; de Leeux et al., 2008). To begin the Planning Phase two primary elements, the purpose of the instrument (Aiken, 1997; Clark & Watson, 1995; Kerlinger, 1974) and the population of interest, were determined. This was conducted to provide focus and utility of the final instrument. For that reason, an examination of relevant literature was conducted. The preliminary review of literature revealed a shortage of survey measures that were designed to capture parent's perspectives of solutions to obesity. In recognition of this existing gap, the proposed purpose of the instrument was to measure parental perception of potential solutions for childhood obesity. These data will contribute to scholars understanding of parents' views, attitudes, and beliefs of specific solutions to childhood obesity, and will serve to provide direction in the development of future obesity prevention and intervention programs.

As recommended by Benson and Clark (1982) specific *domains* and *constructs* be measured in the target group were identified and defined. The domain refers to the content area and the construct pertains to the "abstract psychological trait" (Benson & Clark, 1982 p. 791; Cohen & Swerdlik, 2002) to be measured by the instrument. Remaining in line with the purpose of the instrument, the domains were the possible solutions to childhood obesity (i.e., specific components of empirically based obesity interventions). The constructs, also guided by the purpose of the study, were attitudes and beliefs of parents. As part of this study, greater definition of the above noted constructs and domains were identified.

Next, a literature review of health education, physical education, school health, preventative medicine, psychology, and community health related journals was be conducted to ensure there was not already a measure for this domain and construct, as suggested by Benson and Clark (1982). The literature review assisted in developing operational definitions of the proposed construct(s). The steps taken to develop operational definitions included the collection of pre-existing definitions of adult attitudes, values, and beliefs, then synthesizing the collected definitions that best describe the construct to guide the purpose of this study. The effort to translate conceptual terminology into measurable variables was expressed by de Leeuw and colleagues (2008; Kerlinger, 1986) as a necessary prior to the formation of any items or questions. Kerlinger (1986) argues that researchers

> must decide which concepts they wish to measure. They must define what they intend to measure by naming the concept, describing its properties and its scope, and defining important sub domains of its meaning. The subsequent process of operationalizing involves choosing empirical indicators for each concept or each sub domain. Theoretical concepts are often referred to as 'constructs' to emphasize that they are theoretical

concepts that have been invented or adopted for a specific scientific purpose (as cited in de Leeuw et al., 2008, p. 5-6).

Furthermore, a search for existing instruments that measure similar constructs took place with the intention of analyzing how researchers have previously defined and measured similar constructs (i.e., affective measures of adults and parents, parental perspective, parent opinion) and domains (i.e., obesity prevention programs, obesity solutions for children, risk factors of obesity).

Following the generation of operational definitions of the domains and constructs, the existing literature was surveyed regarding childhood obesity prevention intervention efforts to discover the types of items used to measure the proposed construct(s). Next, with the information gathered from the review of relevant obesity prevention literature and the operational definitions, a series of open-ended questions were developed to draw responses from individual's representing the target population (i.e., parents). Responses to the open-ended questions informed the current beliefs, values, and attitudes of solutions to childhood obesity directly from the targeted population. Kerlinger (1974) and Aiken (1997) advocated similar processes, which include interviews and focus group sessions with target participants as a method of generating and validating content and linguistically relevant language. These methods suggested by Benson and Clark (1982) are supported by foundational measurement methodology (Aiken, 1997; de Leeux et al., 2008; Kerlinger, 1974). Terminology, clarity of concepts, language usage, and confirmation of the operational definitions will result from a qualitative analysis/interpretation of the open-ended responses. Therefore, responses from the open-ended questions guided the construction of items in Phase II.

Benson and Clark (1982) identify the Planning Phase as one of the most critical and necessary phases to developing a meaningful and solid survey instrument. At the conclusion of this phase the purpose and target groups have been identified, open-ended questions were developed, distributed to target population, and analyzed to assist/inform the writing of instrument objectives in subsequent phases.

Phase II: Construction

The next phase of the instrument development process proposed by Benson & Clark (1982) is the Construction Phase that built upon the work from the previous phase and moved into the construction of survey items. At the conclusion of this phase, a working version of the scale was produced. The following tasks were be accomplished during this phase: a) objectives of the instrument and selected format of the survey were determined; b) a table of specifications was developed; c) a pool of items was written; d) a working copy of the instrument will have been administered to a group of target population participants; and e) new or revised items will be added to the existing pool based on qualitative feedback from validation efforts. Guiding this phase are Benson and Clark's 1982 recommendations noted in Table 3.3.

Table 3.3

Phase II- Construction

Step 3	Write objectives
• Step 3a	Select item format
Step 4	Develop table of specifications
• Step 4a	• Hire and train item writers
• Step 4b	• Write pool items
Step 5	Content validation
• Step 5a	• Qualitative evaluation by judges
Step 6	Develop new or revise items

The two initial components of the Construction Phase noted by Benson and Clark (1982) include writing instrument objectives and the selection of survey format. Building the instrument objectives incorporated an analysis of existing instruments and an integration of responses from target group open-ended questions from the previous phase. Each outcome objectives was to reflect an intersection of selected instrument domains and constructs (Benson & Clark, 1982). A "process dimension" (Benson & Clark, 1982, p. 792) encompassing a hierarchical organization of the construct will be reflective within the outcome objectives. For example, if using the affective construct, an outcome objective would include one of the following five categories: (a) receiving phenomena, (b) responding to phenomena, (c) valuing, (d) organization, and (e) internalizing values (Krathwohl, Bloom, & Masia, 1973). Table 3.4 provides examples of outcome objective offered by Benson & Clark (1982).

Table 3.4

Example of Instrument Outcome Objectives

Objective 1: The instrument will assess awareness of the role of the occupational therapist in the schools.
Objective 2: The instrument will assess the valuing of the objectives of occupational therapy educational management.
Objective 3: The instrument will assess internalization of the philosophy of occupational therapy educational management.

Note. From Benson and Clark 1982, p. 792

Once the outcome objectives were written, the format of the instrument was determined. The format of a survey instrument is important because it dictates how data will be presented in

measurable and meaningful units, which subsequently allows data analysis and findings to be reflective of the instrument purpose and outcome objectives. Additionally, instrument format has implications on response rate as it can reduce participant burden through clarity of directions, proper ordering of items, and information organization (Dillman, 2000). Components of the instrument that will influence instrument format include (a) the purpose, (b) constructs, and (c) outcome objectives of the instrument (Benson & Clark, 1982). Existing survey instruments were consulted to assist in the selection of the most appropriate format for the proposed measure.

The next step within this phase is the development of a table of specifications (Benson & Clark, 1982). The table of specifications provides a method of organizing the scope of the instrument, by graphically representing the number of items to be written to address specific domains and constructs (Aiken 1997; Benson & Clark, 1982). The purpose of a table of specification is to force the instrument designer to delineate number of and types of items written that will concentrate on particular areas, this strategy focuses and guides item writing to ensure the test items emphasize the purpose of and objectives of the test (Benson & Clark, 1982). After the table of specifications is created, the designer will use the table as a guide in formulating test items. Table 3.5 provides an example of a table of specifications for the proposed instrument. The organization of the table of specifications, recommended by Benson and Clark (1982) will arrange the horizontal and vertical axis with the domains (i.e., CDC Healthy People content areas such as physical activity, nutrition, and media use) and constructs (i.e., affective taxonomy categories such as receiving, responding, valuing, organizing, and internalizing value) of the instrument.

The domains and constructs intersect within the table of specifications in a single cell. At the point of intersection, the designer must determine how many items that will be constructed to

address the specific relationship of that domain and construct and indicate that number within the cell. For example, in Table 3.5 the cell representing the intersection of "Healthy People Objective 3" and the affective process "Valuing" will be filled with a number of items that will be constructed to address how parents perceive, or more specifically how they *value,* the elements of Healthy People Objective 3 related to nutrition.

Additionally, Benson and Clark (1982) identify that developing the table of specifications will ensure an appropriate number of items be constructed to represent outcome objectives, which as Kerlinger posits will "clarify the research problem and guide the construction" (1974, p. 398) of the items. This strategy promotes item alignment to the instrument outcome objectives (which were written during the Planning phase) while also restricting that developed items 'fit' into only one cell (corresponding with only one horizontal and one vertical category). Benson and Clark affirm this notion through the statement: "…because each objective was constructed with only one content area and one level of the process hierarchy in mind, it should 'fit' in only one cell of the table of specifications" (1982, p. 792). Within Table 3.5, five cells have "Objective #" written within them, which is done to specify which items will address the objectives of the instrument.

Table 3.5

Example Table of Specifications

	Healthy People Objective 1	***Healthy People Objective 2***	***Healthy People Objective 3***	***Healthy People Objective 4***	***Healthy People Objective 5***	***Total***
Receiving	(# items) Objective #	(# items)	(# items)	(# items)	(# items)	**# items**
Responding	(# items)	(# items) Objective #	(# items)	(# items)	(# items)	**# items**
Valuing	(# items)	(# items)	(# items) Objective #	(# items)	(# items)	**# items**
Organizing	(# items)	(# items)	(# items)	(# items) Objective #	(# items)	**# items**
Internalizing Value	(# items)	(# items)	(# items)	(# items)	(# items) Objective #	**# items**
Total	**# items**	**# items**	**# items**	**# items**	**# items**	**# items**

Once the table of specifications was completed, it served dual purposes, a) to focus item writing and b) as a tool within the first item validation effort. Benson and Clark (1982) suggested that item writing be a process that includes a team of individuals, as it can be an arduous task for one person. The suggested number of items to be developed for the item pool is twice as many as the proposed final instrument will include (Benson & Clark, 1982). The development of items was guided by a review of questionnaires designed to measure parent's perceptions (i.e., of childhood obesity, solutions to childhood obesity) to identify how concepts were represented and worded. Following this, a focused effort was taken to generate non-biased, specific, and simplistic items that represent previously implemented obesity prevention tactics within schools, homes, communities, or medical settings.

The next step described by Benson and Clark (1982) was to begin validation process of the generated items in the item pool. Content validity is a critical component in instrument development as it encompasses seeking assistance from a group of people who are experts in the

material. In this case, content specific experts were used to determine how well the "instrument measures what is was designed to measure" (Aiken, 1997, 280). Carmines and Zeller refer to content validity as how accurately a measure reflects the "intended domain of content" (1991, p.20). This validation process will require a critical look at the clarity of stated items, the congruency of items to the desired format, the plausibility of the response items, and the familiarity of wording to the target group (Benson & Clark, 1982), and involved seeking outside content experts opinions and interpretations of the written items (see Pilot Study A).

This final step in this phase was another method of to provide evidence of item validity. This included the presentation of the first draft of the instrument to a group of target population participants (Benson & Clark, 1982). The participants were asked to complete the instrument and when completed provide a short debriefing component highlighting the clarity and content presented on the instrument (see Pilot Study B). The purpose of this pilot study is to determine the clarity of the items and the transparency of the purpose of the instrument from target group participants. As result of responses gathered from Pilot Study B, modifications and changes were made to the instrument.

In conclusion of the Construction phase the conceptual foundation, form and shape of the instrument were established. Additionally, individual items corresponding with the table of specifications, outcome objectives, and purpose of the instrument was developed and reviewed by content experts and an initial group of target participants. This process required extensive collaborative efforts between content experts, target group participants, and the researcher to build the working draft of the proposed instrument.

Participants

Target group participant recruitment. Participants of this study included parents of school-aged children in urban/suburban areas in the southeast United States. Access to parents of school-aged children will be requested through communications with District Directors of the Georgia Parent Teacher Association (GPTA). The GPTA has identified 13 districts across the state of Georgia that are directed by District Directors serving as liaisons. The District Director is an elected position that serves a two-year term. According to the GPTA website (http://www.georgiapta.org, 2008) the organization has a historical stance and commitment to political advocacy and action against childhood obesity. In recognition of this, the decision to seek assistance from the GPTA, an organization that already has stake in the content/purpose of the instrument, may enhance the likelihood of cooperation with the researcher in access/participant recruitment. Information regarding district coverage and contact information will be gained through the GPTA website at http://www.georgiapta.org. The researcher made make contact with the District Directors seeking cooperation and collaboration in this instrument validation process. Phone or email communication with District Directors introduced the project and sought collaboration in participant recruitment. Once a relationship was established with the GPTA several strategies were acted upon to recruit participants at various events and through different mediums such as electronic community.

Sample size. According to Dillman (2000), the total sample size necessary for the validation of the final instrument with a ± 5% sampling error with a 95% confidence level will be 384 parents. This number is based upon a total population size of 320,000 members of the Parent Teacher Association within the state of Georgia (GPTA). Membership criterion of the GPTA is stated on the website as "…an inclusive organization that is open to all adults who care

about children and schools" (http://www.georgiapta.org/membership-faq.html). The sample size was derived using the below formula:

$$Ns = \frac{(Np)\,(p)\,(1-p)}{(Np-1)\,(B/C)^2 + (1-p)}$$

Where: Ns = completed sample size needed for desired level of precision

Np= size of population

P= proportion of population expected to choose one of the response categories

B= acceptable among of sampling error; .05= ± 5% of the true population

C= Z statistic associated with the confidence level; 1.96 corresponds with 95% level (Dillman, 2000). An additional criterion for participant selection will be that individuals must be parent or legal guardian of at least one school aged child and adolescent.

Content expert participants. Selection criteria for content experts included individuals in higher education with backgrounds in content specific areas (i.e., nutrition, physical activity, technology use). These participants possessed a consistent publication record within peer-reviewed journals, which within the last 5 years have been involved with children obesity prevention or intervention scholarship. Individuals were identified and recruited through telephone requests by the author.

Sample size. Ten subject matter experts were identified and recruited.

Institutional Review Board (IRB)

Approval from the University of Georgia Institutional Review Board was attained prior to data collection. Prior to submitting research proposal to IRB the faculty committee of selected scholars will have review and approve the proposal. Components that were reviewed by the IRB

include participant recruitment, participant selection, reduction of risk for research participants, and research methodology.

Phase III: Quantitative Evaluation

The third phase of survey development described by Benson and Clark (1982) highlighted the administration of the provisional instrument to groups of the target population in order to evaluate measurement reliability. At the conclusion of the third phase, a revised version of the instrument was ready for continued validation efforts to begin. In order to reach this point, steps outlined by Benson and Clark (1982) in Table 3.6 were followed.

Table 3.6

Phase III- Quantitative Evaluation

Step 7	Prepare Instrument for First Pilot Testing
• Step 7a	• First pilot administration
• Step 7b	• Debrief subjects
Step 8	Item analysis
• Step 8a	• Calculate reliability
Step 9	Revise Instrument Prepare for second pilot testing
Step 10	Second pilot administration
• Step 10a	• Run item analysis

The first step in this phase required a preparation of the instrument for the first pilot testing. This process required the initial pool of items and participant directions to be typed into the instrument format. Once the instrument was ready for administration, it was administered to a group GPTA members (see Pilot Study C). Through Pilot Study C, participants completed the instrument and a series of debriefing items. The debriefing items provided qualitative evidence of "clarity of items,…purpose of the instrument, and are asked to offer any additional comments" (Benson & Clark, 1982, p.796). Revisions of the questionnaire were made based upon qualitative feedback.

In the guidelines provided by Benson and Clark (1982), the next step required initial calculations of reliability. Reliability is defined as "the consistency or repeatability of a measures" Thomas & Nelson, 1996, p. 220) and can be measured using a variety of methods, including test-retest reliability (Allen & Yen, 1979) and Cronbach's alpha (Aiken, 1997). To begin this process of measuring reliability, initial measures of descriptive statistics (mean, standard, deviation, skewness and kurtosis) were calculated. The descriptive statistics will allowed for item analysis, evaluation of skewness or kurtosis indicating non-normality, small variances and extreme means to indicate necessary of re-working of items (Benson & Clark, 1982; Rowe et al., 1999).

After modifications based on Pilot Study C had been made, the next version of the instrument (see Pilot Study D) will be administered to a new sample with the aim of collecting data for initial reliability calculations. Participants were selected in the same way and the instrument administration and debriefing will also be the same (Benson & Clark, 1982). The initial stability and reliability scores in this study will be calculated.

These data analyzed from the pilot test will provide preliminary reliability estimates for the entire instrument and individual items. As such, these reliability scores are interpretable alongside the qualitative data from the debriefing sessions. Through this interpretative exercise decisions to retain, discard, or revise items will be made. Because of these decisions, a modified version of the instrument were re-assembled with the number of items originally determined. This new version of the scale were pilot tested again, repeating the above-mentioned method. Benson and Clark (1982) suggest that pilot testing will be 'complete' when an acceptable level of reliability has been reached. Once this was attained, the transition into the fourth and final stage of this study occurred.

Phase IV: Validation

The fourth phase as noted by Benson and Clark is the Validation phase. This phase served as a continuation of the validation process of the newly developed instrument. It is recognized that the validation of a newly developed instrument is rarely, if ever complete through one study (Benson & Clark, 1982). Table 3.7 describes the steps undertaken during the Validation phase.

Table 3.7

Phase IV-Validation

Step 11	Repeat Steps 9-10 as Necessary
Step 12	Begin validation
• Step 12a	• Administer for validation date
Step 13	Continue validation

During this phase, the measures of validity conducted on this instrument assisted in determining how well the instrument measured the goals and objectives of the instrument. Additionally, the stability of the items were measured. Validation studies are required of empirical measures as they depict the accuracy of an instrument to measure what it purports to measure (Allen & Yen, 1979; Cohen & Swerdlik, 2002). Messick, a leading scholar noted that instrument validity as an overall "justification for test interpretation and use" of an instrument (Messick, 1980, p. 1014). Scholars agree that validity of measures is critical to mental measures, but at least since the 1950's scholars and measurement theorists have debated philosophical issues revolving around instrument and test validation (Cohen & Swerdlik, 2002).

While Messick proposes that validity is an overall justification, three sources of validity evidence commonly acknowledge a) content validity, b) criterion-related validity, and c) construct validity (APA, AERA, & NCME, 1954; Baumgartner & Hensley, 2006; Benson &

Clark, 1982; Cronbach & Meehl, 1955; Thomas & Nelson, 1996; Aiken, 1997). The combination of these validity concepts were utilized throughout this process to provide evidence of collective validity though multiple efforts and sources that worked in concert to establish a unified of the instrument (APA, AERA, & NCME, 1954). Briefly, two of the sources of validity employed during this study will be offered below.

Content Validity

Content validity is a critical component in instrument development as it encompasses seeking assistance from a group of people who are experts in the material, in this case outside content specific experts, to determine how well the "instrument measures what is was designed to measure" (Aiken, 1997, 280). Benson and Clark (1982) proposed the initiation of content validity within the Construction phase through pilot studies (see Pilot Study A and Pilot Study B). Within the content validation process noted in the pilot studies, two approaches by content experts and representative population samples inspected the purpose, structural features, and outcome objectives of the instrument.

Carmines and Zeller refer to content validity as how accurately a measure reflects the "intended domain of content" (1991, p.20). The first content validation procedure will require a critical look at the clarity of stated items, the congruency of items to the desired format, the plausibility of the response items, and the familiarity of wording to the target group (Benson & Clark, 1982) and will involve seeking outside content experts' opinions and interpretations of the written items. The specific procedures utilized here to establish content validation by content experts to employ the table of specifications, the initial item pool, and an exercise that required the content experts to place single test items within the intended cells (see Pilot Study A). The clarity of the test items and the transparency of the content addressed by the item (Carmines &

Zeller, 1991) are revealed by the ability of the content experts to place the items within the appropriate cells of the table of specifications. Necessary modifications and improvements to test items were then made based on this content validation process. Content experts recommended the addition or deletion of particular items or topics addressed within the instrument.

A second validation source within the Construction phase consisted of a presentation of the first draft of the instrument to a group of participant's representative of the target population (Benson & Clark, 1982). The purpose of this pilot study was to further establish clarity of the items, objectives, and purpose of the instrument from the perspective of target group participants. Participant recruitment and specifics of this content validation process are described in Pilot Study B. In an effort to determine if the instrument measures what it was designed to measure (Aiken, 1997) participants completed the working version of the instrument and when completed, engaged in qualitative debriefing items. Qualitative feedback provided by the participants sought a) comment on the clarity of the instructions of the instrument, b) the identification of relevant, but omitted content, (c) speculation of the intended purpose of the instrument, and d) suggestion of improvements to the quality of the instrument. In response to the qualitative evaluation of the instrument by the pilot study participants, necessary modifications and improvements were made to the instrument.

Construct Validity

Construct validity, defined by Aiken (1997), is "the extent to which scores on a psychometric instrument designed to measure a certain characteristic are related to measures of behavior in situations in which the characteristic is supposed to have a significant effect on behavior" (p. 279). Such strategies were embedded within the phases proposed by Benson and Clark (1982). Nunnally and Berstein (1994) advocated the calculation of construct validity was

more important to be done with abstract (i.e., affective or personality assessment) rather than concrete (i.e., intelligence) tests. The strategies undertaken to calculate construct validity of the new instrument was factor analysis.

To do this, the instrument was administered to a large sample (at least 10 people for every item) of target group participants (Benson & Clark, 1982). The recruitment and distribution of the instrument was the same as previously noted. After data were complied from this administration wave, the analysis assisted in depicting the "nature and number of actors underlying [the] scale" (Benson & Clark, 1982, p. 799). By *factor*, Benson and Clark refer to a "theoretic variable derived intercorrelations of test items" (1982, p. 799), which were projected to emerge from the data. An example of a hypothesis provided by Benson and Clark is: "it would be reasonable to hypothesize that, in factor analysis; separate factors relating to each of the content areas or process levels would emerge" (1982, p. 799).

Factor analysis, is a "mathematical procedure for analyzing the relationships among a set of items …to determine which factors or constructs account for the relationships" (Aiken, 1997, p. 164). The result of a factor analysis is a set of loadings or correlations of the variables "on each of the factors extracted by the procedure" (Aiken, 1997, p. 164). Additionally, through this procedure the amount of variance in the scores will be determined and rotated appropriately to signal factors of greatest and least significance (Aiken, 1997).

The indispensability of test and instrument validity begins during instrument development process and is considered a continuous on-going process (Kaplan, 1964) that is often conducted with various populations, target groups, and researchers. Benson and Clark (1982) note that one factor analysis does not provide enough evidence. It is necessary or recommended "seven factor analytic solutions are often necessary to validate the underlying

structure of the new scale where each subsequent solution must be obtained on a new sample" (p.799). Therefore, it will be necessary to continue on-going validation of this instrument with subsequent studies.

Summary

This study employed a four-phase reiterative instrument development process proposed by Benson and Clark (1982) to develop a survey instrument that will measure parent perceptions of solutions to childhood obesity. Within the purported phases, multiple strategies were employed to establish preliminary validity and reliability of the newly developed instrument. Subsequent chapters will provide a detailed explanation of the steps undertaken and the resultant of the validity and reliability efforts.

CHAPTER 4

PHASE I: PLANNING

This chapter will present the first of the four phases devised by Benson and Clark (1982). The Planning Phase required foundational steps to be taken to establish conceptual and theoretical underpinnings of the proposed instrument. During this initial phase the following steps were taken (a) the purpose of the instrument was devised, (b) review of existing instruments was consulted for open-ended item development, (c) pre-pilot test was conducted with representative population sample and (d) item format was determined. These critical steps solidified the foundation of the instrument and served to propel subsequent pilot testing and instrument development. The process of carrying out these steps is presented below.

Purpose of the Instrument

The purpose of the instrument was to measure parent perceptions of a) childhood obesity locus of control and b) potential solutions to obesity. Parent *perceptions* (i.e., attitudes and beliefs) were the construct measured by the instrument and the target group was parents of pre-school to college-aged children. The two independent domains measured by the instrument were a) beliefs of childhood obesity locus of control and b) support for childhood obesity prevention strategies.

Review of Literature

To ascertain that an existing measure had not already been developed to capture the domains of the proposed instrument, a review of literature was conducted. Further Benson and Clark (1982) establish that investigating the measurement of current instruments that propose to measure similar constructs is advised in order to most efficiently and effectively define the construct and domains of measure. To do this, contemporary obesity-related scholarship was

examined for the use of or mention of measurement instruments utilized to capture perceptions of obesity locus of control or obesity prevention strategies. Several instruments surfaced with similar characteristics and foresight. Descriptions of these prominent instruments are presented in Chapter 2, these include *Perceptions of Youth Obesity* (Price, Desmond, Rupport, & Sauder, 1992), *Lay Perceptions of Childhood Obesity Survey* Hardus, van Vuuren, Crawford, & Worsley (2003), a scale based upon the School Health Index (Murnan, Price, Telljohann, Dake, & Boardley, 2006), the *Parental Perception of Body Mass Index and Obesity in the School Age Child* (Murphy & Polvika, 2007), and the *Childhood obesity questionnaire (COQ)* Covic, Roufeil, & Dziurawiec, 2007). The vast majority of the existing measures seek to capture adult perspectives and knowledge of childhood obesity, but only a few (Hardus et al., 2003; Covic et al., 2007) capture beliefs of causal factors and obesity prevention strategies. Therefore, finding no existing instruments aligned to measure American perspectives of contributing factors of childhood obesity or prevention strategies; it was concluded appropriate to begin development of a new and much needed instrument.

Open-ended Questions

Benson and Clark noted that assembling an authentic representation of the sample populations voices and ideas prior to developing any survey items was imperative. A rationale for this strategy elicits the discovery of terminology and language used by participants when addressing this topic- subsequently providing guidance for item development using linguistically relevant terms and phrases (Aiken , 1997; Kerlinger, 1974). Another justification of this exploratory strategy is to find out what parents believe about the topic without impressing limited choices or guiding responses. This type of exploration could be accomplished through

focus groups, group interviews, or open-ended questionnaire responses. For this study, the methodology selected was open-ended questionnaires.

The format of the questionnaire included nine open-ended items and two alternative response items. The nine open-ended items elicited candid responses pertaining to parent's beliefs about causal factors of childhood obesity, the sources in which inform their beliefs, and their suggestions of prevention strategies at various social levels. Shown in Table 4.1 are several examples of the developed open-ended questions.

Table 4.1.

Sample Open-ended Questions for Pre-Pilot Study

1. What do you believe to be the cause(s) of obesity in children?
2. Who you believe to be responsible for reducing childhood obesity?
6. In your opinion, what should the federal government do, if anything, to assist in the reduction of childhood obesity?
11. In your opinion, what should parents do, if anything, to assist in the reduction of childhood obesity?

The two alternative formatted items included two separate pre-selected lists. The first list offered thirty-two terms and adjectives typically identified within obesity-related literature. This was designed to provide an opportunity for participants to strike thru words they would not use in everyday language. Examples included *elitist, obese, always, pointless, obligation,* and *responsible* and provided the researcher insight to terminology to avoid while writing items for

the population of interest. The second list involved seventeen pre-selected obesity prevention strategies. Participants would rank-order their five most preferred strategies from the list provided. For a complete list of the eleven open-ended items and participant consent documents, see Appendix C and D. These items were piloted with a group of educational research graduate students prior to administration. It was approximated to take 15 minutes to complete the instrument, which appeared a reasonable amount of time.

As previously stated, the purposes of the open-ended items were to discover terminology and language used by participants and find out what parents believe about the causes and potential solutions to childhood obesity. Therefore, the eleven-item open-ended questionnaire was distributed to a small sample of participants, representing the target population. This process was named the Pre-Pilot Study as it served to establish the direction and foundation for succeeding item writing and pilot testing. The details of the Pre-Pilot Study are described below.

Pre-Pilot Study

The purpose of the open-ended questionnaire was to discover what individuals within the target population thought about childhood obesity, in particular the causes and solutions. This would serve to guide and substantiate upcoming steps in the process of instrument development. To do this, the developed open-ended items were distributed to a small sample of target group participants, responses were analyzed, and the findings exemplify the launch of instrument development.

Participants

Participants included seventeen parents (n= 17) who completed the open-ended questionnaire at a Georgia Parent Teacher Association (GPTA) event. The event was a health fair that was open to the public and hosted within a public school gymnasium on a weekend

morning. The researcher set up a table and display board with information about childhood obesity and the research project. Parents were verbally recruited by the researcher to complete the questionnaire. A brief explanation of the project was presented and upon volunteering, parents received a packet of information with an introductory letter and the questionnaire. Consent was implied by the completion of the questionnaire.

Method

Participants responded to the eleven open-ended questions in paper/pencil format while seated at the health fair event. The format of the items was described above. Completion time of the instrument was approximately 15 minutes.

Data Analysis

The open-ended response data were analyzed qualitatively with theme identification, whereas the alternative response items were analyzed using a basic frequency analysis tactic. Rudimentary theme identification was conducted within item responses, the explanation for it being rudimentary was due to the small sample size and limited data. The open-ended responses were also evaluated with content frequency tactics that included the summation of terms used and content identified by participants; the criterion for mention was consistency across ≥75% of the responses. The frequency analysis of the alterative items is reported in format depicting the frequency of agreement across respondents. Representative findings will be presented.

What do you believe to be the cause(s) of obesity in children? When participants were asked to identify what they believed to be the cause(s) of childhood obesity (Item 1) responses spanned individual behaviors and actions taken by others in children's lives. Examples of individual behavior statements include "laziness" (Participant 16) and "watching too much TV, too many video games, eating out at fast food" (Participant 10). Instances of others or external

influences on childhood obesity included "food in schools" (Participant 5) and "Parents don't really watch carefully, how bad their kids are eating. *The Fast Life*. Kids tend to eat out a lot here in the U.S. As well as sodas and school lunches may cause obesity" (Participant 4). Noticing the trend in responses alluding to the *role of who* was controlling or responsible for obesity, the responses were then sorted into three recognized categories a) internal, b) chance, and c) powerful others. These categories are accepted dimensions of a health locus of control construct presented by Wallston, Wallston and DeVellis (1978). Table 4.2 illustrate all participant responses post-sorting into the three noted categories. The correspondence of the item responses into the three categories was reinforced in how well the response represented the categories.

Specific responses within the *powerful others* category identified parents as primary to the cause of childhood obesity. This was evident in the number of times the word *parent was* identified in the comments (>50%). Responses fitting within the Internality dimension represented two primary behavioral culprits: exercise and nutrition. These comments embodied the actual behaviors and habits enacted by children. Finally, responses relating to genetics and economic status were perceived by the research to personify Chance-Externality category. The rationale for this decision was based upon the lack of choice children have relative to their genetic make-up or the economic status of their family members. These data epitomized the three categories presented by Wallston et al (1978) and provided support for further investigation of these three control factors/dimensions.

Who do you believe to be responsible for reducing childhood obesity? Table 4.3 identifies the participant responses to this item. A majority, 76.4%, of the participants noted parents as primary in their answers to this question. While some included additional factors in conjunction with parents, such as "parents and children can both play a role" (Participant 12) and

"Everybody, not just parents, but school and government implementing more support programs for health" (Participant 9), the consistency of responses provides support of the findings from Covic et al., (2007) whereby parent responsibility was one of the primary solution strategies identified by Australian adults. From this standpoint and consistent with previous work, preliminary evidence of obesity prevention approaches focused in the home and with parents may yield positive support from parents.

Table 4.2

Responses to *What do you believe to be the cause(s) of obesity in children?*

Internality	**Chance- External**	**Powerful Others-External**
"children watching more TV and playing more video games"	"family history"	"there isn't enough exercising in school"
"soda, fries…video games"	"sometimes not enough money [for fruits and vegetables]"	"time (lack of planning meals, schedule convenience of the drive thru"
"children are less active- more TV watching and video games"	"genes"	"busy schedules causing poor food choices by parents"
"fast food, TV, video games"	"genetics"	"parents don't really watch carefully how bad their kids are eating"
"watching too much TV, too many video games, eating out at fast food"	"genetic factors"	"sodas and lunches may cause obesity"
"diet habits"	"genetics"	"food in schools"
"sugar intake level"		
"emotional issues (using food as comfort), poor diet … high		

calorie/high fat foods”	“parents don’t have time to cook”
“exercise habits”	“the bad habits to eat at home”
“laziness”	“parental influence”
“unhealthy diet and lack of exercise/physical activity”	“parents not pushing kids away from TV/games”
“lack of adequate exercise, lack of nutritious food”	“laziness (perhaps reinforced by parents)”
	“lack of understanding (nutrition) in parents”
	“poor diet (not making foods available so kids can choose”
	“peers”
	“lack of support from family and society at large”
	“education from school”
	“education from community”
	“commercials”

Table 4.3

Reponses to *Who do you believe to be responsible for reducing childhood obesity?*

Parents	Other
"parents should make sure kids are eating correctly and exercising each and every day"	"healthy meals"
"parents, guardians, and caretakers"	"limited TV and video games'
"educate the parents"	"healthy food"
"parent education"	"more active lifestyle"
"child's parents"	"increased awareness"
"parents"	"entire society, surrounding community, government"
"Everybody, not just parents, but school and government implementing more support programs for health"	"school lunches/breakfast provided for children"
"parents"	"TV commercials, food industry, parents"
"parents and children can both play a role"	
"parents primarily"	
"parents"	

Words to describe attitude toward obesity prevention. Results from the first alternative response item that required respondents to read a list of pre-selected words and identify which they would and would not use in everyday language to describe their attitude toward childhood obesity prevention provided insight to terminology to be omitted from future items. Table 4.4

highlights the responses, which are organized in columns to present terms that were selected for use and terms that were to be rejected for use. The decision to omit terms/expressions from future item was based on a minimum of four (equal to 25%) of the respondents indicating they would not use to describe their attitude toward preventing childhood obesity.

Overall, the rejected terms revolved around negative connotative words such as *useless*, *wasteful*, *pointless*, and *strongly reject.* Other words that were rejected were more scientifically based such as *excess adipose tissue*, *fat mass*, and *fat*. Taken this, it could be interpreted that the attitudes toward obesity prevention of this group of parent participants is overwhelmingly positive. Interestingly, retained words included *my responsibility* and *obligation*, which infer sentiments of accountability and urgency- coming from parents; this again affirms the findings from the previously noted responsibility for reducing childhood obesity.

Table 4.4

Selected verse Rejected Terms from Open-Ended Exercise

Selected Terms	Rejected Terms
useful	elitist
obese	meaningless
meaningful	fat
always	strongly reject
strongly support	never
my responsibility	excess adipose tissue
healthy	fat mass
concern(ed)	useless

body mass index	guilt
responsible	wasteful
role	unconcerned
necessary	futile
needed	pointless
overweight	
unhealthy	
significant	
obligation	
very serious problem	
potential	
contributing factors	

Collectively, the open-ended items provide evidence that the sample of parents identified causal factors of childhood obesity that were highly associated to the three dimension of Wallston, Wallston and DeVellis (1987) health-related locus of control construct. Additionally, participants consistently noted parental influence as vital to the reduction of childhood obesity and provided a set of terms that are not representative of everyday language used to represent attitudes towards obesity prevention. Data not represented in this section can be found in complete form in Appendix E.

Established Theories Guiding Item Writing

The final step presented by Benson and Clark (1982) in the Planning Phase is to decide upon the format of the instrument items. In coherence with the purpose of the instrument to

measure parent perceptions of (a) childhood obesity locus of control and (b) obesity prevention, various item response formats were examined for their effectiveness to measure the proposed construct and domains. The first version of the instrument consisted of three sections, each of which were founded in different theories guiding item writing and response options. The three sections a) attitudes towards obesity prevention, b) locus of control of obesity, and c) support for childhood obesity solutions, will be described.

Section 1: Attitude Toward Obesity Prevention

The Attitude toward Prevention section was developed using a Thurstone & Chave (1928) scale technique. This technique involved items be scaled "with regard to their un-favorability or favorability toward a given attitude" (Roberts, Laughlin, & Wedell, 1999, p. 213). This scaling format can be utilized to measure attitudes of a one-dimensional or linear construct. Accomplished by anchoring two end points with qualitative attitude statements (i.e., extremely support and extremely reject), this strategy also associates an odd number of numerical intervals along a linear continuum. It was decided to utilize a seven-point continuum, based upon pilot testing evidence of distinct differentiation between the interval/attitude categories. Each of the numerical intervals was to represent equal intervals of the posed attitude (Thurstone & Chave, 1928), ranging in successive order (Safir, 1937) from extreme support to extreme rejection of obesity prevention strategies. The mid-point interval of four represented a neutral attitude.

The basis of the item content within this proposed Thurstone scale was drawn from the postulate opinion formation factors identified by Oliver and Lee (2005). These scholars suggested the four factors noted to most influence opinion development were an individual's: a) degree of interest and awareness, b) beliefs relative to the causes, c) understanding and attitude relative to different but seemingly similar issues, and d) self-interest of an issue (Oliver & Lee,

2005). Being that one assumption of a Thurstone scale is that the measured construct is one-dimensional, the primary factor of interest noted by Oliver and Lee (2005) was degree of interest and awareness. Therefore, the process of item writing included statements of striations of attitude representing the support and opposition of childhood obesity prevention.

The participant response options for the items was dichotomous (agree/disagree), therefore the conceptual underpinning of this framework depicts that if items are truly interval in nature and accurately correspond to the striations of attitude, respondents would theoretically respond in favor with statements aligning with his/her beliefs and consequently disagree with the contradictory item situated on the opposing end of the continuum. If this response pattern were consistent across respondents, then simple calculations could transform the data into interpretable and formidable attitude groupings consisting of individuals with like perspectives on the measured construct. Taken this, the development of items along a seven-point continuum representing the degree of interest and awareness childhood obesity prevention, was purported to inform the incidence parents supporting obesity prevention based upon their attitudes if interest and awareness of the issue.

Section 2: Childhood Obesity Locus of Control

The Childhood Obesity Locus of Control section was conceptually modeled after the multi-dimensionality of the Wallston, Wallston and DeVellis MHLC scale (1978). Specifically, the three dimensions a) internality, b) chance-externality, and c) powerful others-externality provided a substantive framework to develop items representative of the noted framework. The item response format that Wallston and colleagues subscribed to was a 6-point Likert scale, which will be modified but resembled in this proposed section.

Likert items are statements written "in such a form as to permit a 'judgment of value' rather than a 'judgment of fact' (Likert, 1939, p. 12). This necessitates participant response to the item in reference to "the wants, desires, and cognitive dispositions of the subjects, not with their opinions regarding matters of fact" (p. 13). Likert scales have been commonly used to tap into multi-dimensional constructs and latent variables such as "intuitive appeal [and] adaptability" (Hodge & Gillespie, 2003). Of particular interest for this study are latent variable of attitude/perception and the multi-dimensional construct locus of control (Wallston & Wallston, 1976).

Likert items are specifically formatted single items in which the response options includes a combination of quantitative and qualitative assignment (i.e., 1=strongly disagree, 2=disagree, 3=neutral, etc) (Likert, 1939). An underlying assumption pertaining to Likert items states that response options must be represent equally spaced intervals with corresponding qualitative and quantitative pairs. The equal intervals allow respondents to judge the statement and respond along a representative attitude gradient. Another assumption is that there must be a mirrored opposite of each item on a symmetrical gradient on either side of the neutral point (i.e., somewhat agree and somewhat disagree).

Based upon pilot test evidence, it was determined to assign the attitude statement with a 5-point Likert response scale (Likert, 1939). In effort to reduced agreement response tendencies (Spector, 1992) both negatively and positively worded items were written to represent each dimension. The negatively worded items are reverse scored to assure the items remain on the same continuum as the positively worded items. Items with varying direction (negatively or positively worded) have been evidenced to aptly measure the same construct (Bergstorm & Lunz, 1998).

Section 3: Solutions to Childhood Obesity

The third and final section of the instrument entailed various obesity prevention strategies that encapsulated the five obesity-related focus areas promoted by *Healthy People 2010* (CDC, 2000). Provided that the goals of the nationally coordinated *Healthy People* initiative are to a) increase quality and years of healthy life and b) eliminate health disparities, the significance of pursuing obesity prevention strategies that ensue within the designated focus areas would jointly promote the attainment of the noted goals. The focus areas are Nutrition and overweight, Physical activity and exercise, Education and community-based programs, Environmental health, and Access to quality health services.

Following the categorization of obesity prevention strategies within the five focus areas, the strategies were then sorted based within Brofenbrenner's Ecological Systems Theory (1979), better known as the Social Ecological Model (SE Model). The SE Model was formulated from the study of social ecology (Hawley, 1950) which presents the interaction and influence that people and an environment have on one another. Klien, Tosi, and Cannella (1999) and Rousseau and House (1994) put forth the relationship between individual and environment are discontinuous and have cross-level effects. This means that within different situations and experiences of one's life, the impact factors within different social levels have on one's attitudes, beliefs, and values is punctuated and intermittent.

Figure 4.1 illustrates the interrelated nature of the five social levels noted by Brofenbrenner (1979). Only four were utilized to categorize obesity prevention strategies: a) Interpersonal/Lifestyle Influences, b) Institutional/ Organizational, c) Community, and d) Social Structure/Policy. In 1988, McElroy, Bibeau, Steckler, and Glanz published a paper describing the implications potential integration of using an ecological perspective when developing health

promotion programs, which further supports the appropriateness of this model. The definitions of each level proposed by McElroy and colleagues state:

Individual- Individual characteristics that influence behavior such as knowledge, attitude, beliefs, and personality traits

Interpersonal/ Lifestyle Influences- Interpersonal processes and primary groups that provide social identity and role definition (family, peers, social networks, associations).

Institutional/ Organizational- Rules, regulations, policies, and informal structures (schools, religious groups).

Community- Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

Social Structure/Policy- Local, State federal polices and laws that regulate or support healthy actions.

It is evident through empirical based research that childhood obesity is a complex and multi-dimensional construct, and therefore factors embedded within different social contexts (i.e., parental eating patterns, community parks availability, compulsory school-based physical education) can either positively or negatively influence childhood obesity. Likewise, large scale (i.e., food tax and regulations) and small-scale (i.e., parental education on physical activity health benefits) social methods of addressing obesity in children may also produce punctuated or sustainable value development relating to health and wellness.

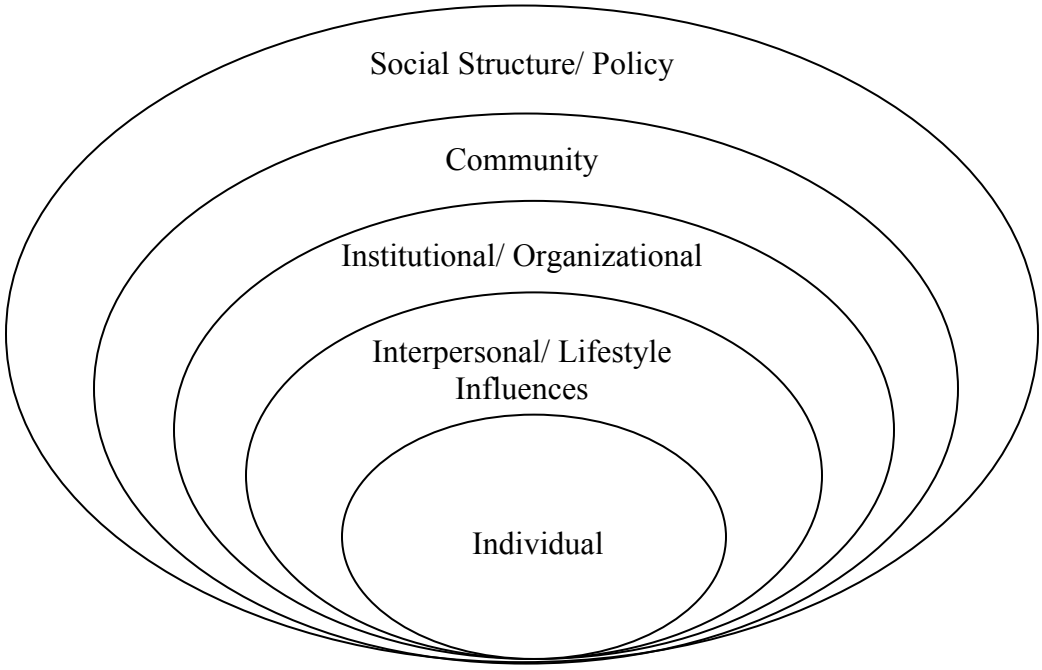

Figure 4.1 Brofenbrenner's Social Ecological Model

Using the two organizational and conceptual frameworks, the decision was made to use rank ordered item response format within Section 3. This forced choice strategy requires participants to configure the selection options in priority of greatest value. Utilization of this rank order response produces a seriated and successive data set. The data set will then espouse participant favorable and unfavorable prevention strategies, with distinction of type and social context.

The grouping of the solution options were conceptually aligned to represent the CDC focus areas. Each of the four solutions represented one of the four SE Model social levels. The purpose of this was to have a broad representation of content addressed in the solutions and the

social context of implementation. The dual categorization of item groupings provide a framework for participant rank ordered data to be analyzed.

Phase I Summary

The purpose of this study was to develop and validate a survey instrument to measure parent perceptions of solutions to childhood obesity. Benson and Clark (1982) present the initial phase of their instrument development model, the Planning Phase to be one of the most critical as it sets the stage for subsequent item develop within contemporary relevant literature and theoretical foundation to which propel development and analysis. During this phase, the purpose of the instrument originated. The purpose was *to measure parent perceptions of (a) childhood obesity locus of control and (b) potential solutions to obesity.* A review of existing survey instruments provided further evidence that the only two existing surveys that purport to measure causal factors and solutions to childhood obesity have been developed and utilized in Australia, of which both remain in exploratory development phases.

Further justification for the development of this instrument emerged from qualitative data from participant debriefing responses. In summary, participants noted primary causal factors associated with obesity to represent three locus of control dimensions established by Wallston, Wallston, and DeVellis (1978) Internal, Chance-External, and Powerful Others-External as well as parents playing a vital role in the reduction of childhood obesity. Finally item format to be employed in the following phase were presented with the intention to buttress and uphold the purpose of the instrument. Utilizing these data and the foundations established in Phase I, the following chapter will describe Phase II Item Construction that encompasses many of the foundational deductions established from these efforts.

CHAPTER 5

PHASE II: ITEM CONSTRUCTION

The next phase of the instrument development process proposed by Benson and Clark (1982) is the Item Construction Phase that will build upon the work from the previous Planning Phase and transition in the production of survey items. During the Item Construction phase the following tasks were set forth to be accomplished: (a) objectives of the instrument were stated, (b) table of specifications was developed to delineate item distribution patterns, (c) initial item pool was written and pilot tested with subject matter experts, and (d) modifications to initial item pool were made based on pilot test analysis. Detailed below is the execution of the noted steps within this phase that entails the application of previously established literature, theoretical frameworks guided by the purpose and intent of the instrument. As a result of this phase, the launch of a working version of the instrument was achieved for critical analysis and pilot testing.

Instrument Objectives

Benson and Clark present the necessity of developing instrument objectives that declare specific and measurable aims of the intended instrument. Instrument objectives depict the function(s) of an instrument with precise explanation of outcome measures and prospective data to be produced as a result of the noted instrument. Objective statements were derived in part by the review of construct and domain literature (e.g., childhood obesity locus of control and obesity prevention strategies) as well as the qualitative data offered by the Pre Pilot study. As a result, five instrument objectives were developed:

The proposed survey instrument will:

1. Measure degree of support parents identify for childhood obesity prevention strategies;

2. Measure parent perceptions of childhood obesity locus of control. The instrument will identify participants subscribing to the following locus of control dimensions:
    a. Internality
    b. Chance – Externality
    c. Powerful Others – Externality;
3. Measure parent perceptions of support to specific childhood obesity related strategies established within differentiated social levels.

Based upon the stated instrument objectives subsequent item development and the conditional assessment of the instrument's ability and capacity to accurately achieve these objectives will influence the decisions made during the process to follow.

Initial Pool Items

The next step imparts the development of the initial pool of instrument items. Based upon the purpose and objectives of the instrument, previous construct and domain literature, and abiding by the functions of guiding theories of item development a pool of 148 initial items were written. Clark and Watson (1995) encourage the number of items within the initial item pool to be over inclusive rather than under inclusive. That is, that care must be taken to ensure "each content area of the construct has an adequate sampling of items" (Netemeyer, Bearden, & Sharma, 2003, p 96). Further, DeVellis (1991) stated that developing twice as many items within the item pool as desired for the final instrument is recommended to ensure after item analysis is complete there still remains a robust number of items to represent the construct. Following such guidelines, the development of the item pool representing each section of the instrument is described.

A total of one hundred and forty eight items were written to be included within the initial item pool. The items were written to represent three sections and therefore, the breakdown of items within the initial item pool for Section 1 was thirty-one, Section 2 was thirty-six, and Section 3 equaled eighty-one. See Appendix F-I for a list of all initial pool items.

Section 1 Attitude towards Obesity Prevention

The section designed to measure parent attitudes toward childhood obesity prevention originally comprised 31 items. The items were developed based on a factor posed Oliver and Lee (2005) which postulated that a significant influence of opinion development involved an individual's degree of interest and awareness of a topic. Utilizing item format established by Thurstone and Chave (1928) the items were written to compass a seven-levels of striated attitude statements expressing an individual's degree of interest and awareness of childhood obesity prevention. It was a challenge to unify the noted construct, of interest and awareness, into a one-dimensional component (Thurstone & Chave, 1928), yet effort was made to do this. The 31 items embodied elements of individual burden, immediacy of action, and knowledge of the issue, financial commitment, and perceived need of action. Items were phrased into attitude statements representing a range of attitudes representing the 7-point continuum of *extreme support* to *extreme opposition* to obesity prevention from the standpoint of the above-mentioned elemental perspectives. A complete listing of Section 1 initial pool items can be seen in Appendix F.

Section 2 Childhood Obesity Locus of Control

The section designed to measure perceptions of childhood obesity locus of control consisted of 36 developed items. Modeled after the MHLC (Wallston et al., 1978) and the qualitative findings of the Pre Pilot Study, items were written to exemplify the three following dimensions Internality, Chance- Externality, and Powerful Others- Externality. Twelve items

were written to represent each of the aforementioned dimensions. In some instances, terminology offered by the Pre-Pilot study participants was used in the development of the questions and in other the MHLC was consulted for phrasing and word choice to represent the veracity of the dimensions. As previously mentioned in Chapter 4, positively and negatively worded items were written, specifically four within each dimension, to increase participant item attentiveness and reduce agreement response tendencies (Spector, 1992). The items were then associated with a 5-point Likert response. A complete listing of Section 2 initial pool items can be seen in Appendix G.

Section 3 Solutions to Childhood Obesity

The initial pool of items written to represent the final section assessing participants rank ordered responses to childhood obesity prevention strategies included 81 items. The principle basis for these items involved an analysis of the published obesity prevention strategies that had been implemented or suggested from 1989-2008. From this pursuit, a collection of 124 (Appendix H) prevention strategies were identified and subsequently sorted by means of the SE Model social layer the strategy would be implemented. This resulted in 21 strategy items representing the Interpersonal level, 35 in the Institutional level, 36 in the Community level, and 32 within the Social Structure/Policy level. Supplemental terminology used in the Pilot Study A associated the SE Model level titled proposed by the original Ecological Systems Theory (Brofenbrenner, 1979) included Micro, Meso, Exo, and Macro, with qualitative descriptors that incorporated the SE Model level descriptors.

Next, the items within each social level were sorted by content. Content was depicted by the five CDC's *Healthy People* focus areas. The five categories included: a) Nutrition and overweight, b) Physical activity and exercise, c) Environmental Health, d) Educational and

community-based programs, and e) Access to quality health care. The distinction of content was judged on the chief intervention component described by the intervention authors. Following the dual categorization of solution strategies by SE Model social layer and CDC *Healthy People* focus areas was complete; an evaluation of the strategy uniqueness was executed to solidify the representation of strategies identified and reduce repetitious strategies. As a result, 20 solutions from each SE Model social layer category were selected (four from each CDC focus area) based upon the uniqueness from other solutions within the same categorization. This was done to diversify the sample of potential solutions across social level and content, while reducing the effect of repeated ideas, solutions, and strategies. A total of 81 dually categorized strategies were identified and provided the initial item pool for Section 3. A complete listing of Section 3 initial pool items can be seen in Appendix I.

Summary

At the conclusion of item pool construction, the three sections of the instrument were represented by a composite of 148 items. Each section possessed 31, 36, and 81 representative items. Taken the developed items for each section a single formatted electronic document was developed for the evaluation of the content and face validity exercises by subject matter experts in Pilot Study A.

Pilot Study A

The purpose of Pilot Study A was to evaluate the face and content validity of the items within the initial item pool. The evaluation was conducted by a group of subject matter experts and served to provide evidence that the items were suitably representative of the domains and construct. Further, Pilot Study A was the first of many efforts to assure the item and direction

clarity for the inclusion of subsequent versions of the instrument. The procedures enacted to complete this pilot test are described below.

Participants

Participants in Pilot Study A included 9 subject matter experts in the areas of children's health, physical activity, nutrition, obesity prevention and obesity intervention development. The selection criteria included: a) scholars in the above-mentioned lines of research, b) actively contributing to the body of knowledge as evidenced by recent publications in peer reviewed or field-based journals, and c) members of higher education and academia. Fifteen subject matter experts were identified through a review of table of contents of prominent journals in the area of obesity, physical activity, and public health; and also by utilizing the Chapter 2 review of obesity prevention and intervention literature. Participants were recruited via email with a description of the study and an invitation to participate in the validity exercises. Nine subject matter experts agreed to participate.

Upon agreement, subject matter experts were sent electronic documents that further described the study and requested their preference of three format options to which they could complete the item sorting exercises, these included a) face to face, b) postal mail, and c) electronic survey host. All nine participants indicated preference to participate via electronic survey host (e.g., www.surveymonkey.com). Consent documents, seen in Appendix J were attached to follow-up emails associated with the electronic link that directed them to the survey. Consent was implied upon the completion of the electronic item-sorting task. Participants were asked to complete the content evaluation exercise within two weeks of receiving the introductory email.

Method

The subject matter expert participants utilized an anonymous electronic survey host program (e.g., www.surveymonkey.com) to complete and submit responses. The participants completed three item analysis exercises on two separate occasions. The first two exercises (Section 1 and 2) were completed simultaneously and the third (Section 3) was completed two weeks later. The separation of the three exercises was due in consideration of the time required to complete the three exercises collectively. The amount of time it was estimated to complete Section 1 and 2 was 25 minutes, to complete Section 3 approximately 25 minutes. Descriptions of the content evaluation exercises are presented below and examples of each exercise are identified in Appendix K and L.

Section 1 Attitude towards Obesity Prevention. The 31 items written to span the seven attitude categories with presumably equal attitude statements were placed first in the series of two electronic item-sorting sections. Fifteen expert judges were provided the following directions to assess the attitude statements:

> *Scale Orientation: The seven-point response key represents a continuum of seven equal intervals. The continuum was anchored at 1 and 7, which are both labeled with statements that reflect an extreme attitude toward childhood obesity as a social issue. Category 4 is labeled 'Neutral'. The remaining numbered categories (2, 3, 5, & 6) are not labeled, but are to represent equal-appearing intervals of the stated attitude and successive in nature.*
>
> *Judges Task: 1) Please read each item below and evaluate the item's content based upon its place along the continuum. Place a check mark in the numbered category that corresponds with the attitudes displayed on the scale. PLEASE NOTE: These are NOT MEANT TO REFLECT YOUR OPINION, but your analysis of the statements and the attitude category to which they belong. When finished each of the seven attitude*

categories should possess only items that reflect that specific category. Attitude Category Labels: 1= The attitude of a person who believes childhood obesity IS a social issue that needs attention. 7= The attitude of a person who believes childhood obesity IS NOT a social issue that needs attention.

The electronic content and item analysis required the judge to read the attitude statements then select the corresponding number, on the seven-point scale, that they felt best represented the attitude interval of the statement. The seven-point continuum was anchored with two qualitative statements and also at the mid-point. At the end point with a numerical value of 1, the descriptor was *The attitude of person EXTREMELY in favor of childhood obesity prevention*, and at the opposite end with a numeric value of 7 was *The attitude of person EXTREMELY opposed to childhood obesity prevention* and at the mid-point of 4 was the word *Neutral*. The remaining numbered categories had no descriptors and were left unlabeled to necessitate the experts to determine the intensity of the attitude represented within the remaining numbered intervals on both sides of the neutral point (Thurston & Chave, 1929). Individually and anonymously, the subject matter experts assigned each item a value between one and seven. As a result of this exercise, the subject matter experts contributed to the validity evidence items based upon their evaluation of the items' content.

Section 2: Childhood Obesity Locus of Control. The 36 childhood obesity locus of control items were written to represent the MHLC dimensions a) Internality, b) Chance-Externality, and c) Powerful Others- Externality were placed onto the electronic survey host site. As the items (12 per dimension) were written to fit within specific dimensions this validity exercise required the subject matter experts to evaluate, based on their knowledge and experiences, how well the item represented each of the three dimensions. The resulting data

would calculate agreement among respondents relative to which dimension of childhood obesity locus of control the item best fit. Nine expert content judges completed a content analysis/ item analysis on section to using the following directions:

> *Scale Orientation: Below are 36 statements pertaining to who or what influences childhood obesity. Three dimensions of Locus of Control (Internal, External-Chance, and External-Powerful Others) are identified in the response columns. Under each dimension, there is a pull-down box that has the numbers 1-5. The numbers represent the strength that the statement reflects that particular dimension of Locus of Control. See below for qualitative labels of the numeric values.*
>
> *Judge's Task: 1) Please read each item and evaluate the content of the statement. Based upon your analysis, assign a numeric value (1-5) under each dimension for all statements. PLEASE NOTE: These are NOT MEANT TO REFLECT YOUR OPINION, but your analysis of the strength each statement represents each dimension. When finished you should have three values assigned to every item. Numeric Values:1= Does not represent this dimension at all. 5= Most strongly represents this category.*

This item sorting category required content experts to identify the strength of association each item had to the three locus of control dimensions. Participants assigned a numeric value representing strength of association, the value of 1 indicated *does not represent this dimension at all* and the value of 5 illustrated *most strongly represents this category*. The remaining values (2,3, and 4) were representative of stratified associations within the two end points.

Section 3: Solutions to Childhood Obesity. Subject matter experts (*N*=10) participated in the second wave of face validity exercises involving Section 3. The 81 dually categorized obesity prevention strategies were placed in electronic format and were displayed with a five response alternatives. The response alternatives were categorical and depicted the four SE Model social levels along with a "NA" response option. The 10 subject matter experts received the following exercise instructions and explanation:

> *Scale Orientation: The four category choices below represent the social levels noted in Brofenbrenner's Ecological Systems Theory (1979) as micro-, meso-, exo-, and macro-levels of society that influence an individuals beliefs, values, attitudes, and behaviors. The description of each social level are provided below.*

Judges Task:
1) Please read the items below, each represents an obesity prevention strategy implemented within different social levels. After reading the item, evaluate which social level the prevention strategy best corresponds and place a check mark in the appropriate category. If you believe the item does not fit within any of the categories, a N/A column is provided.
2) In the text box at the bottom of the page provide a brief statement about the items you placed within the N/A category OR found difficult to categorize.

Category Labels:

MICRO- (Interpersonal)= Interpersonal processes and primary groups that provide social identity and role definition (family, peers, associations).

MESO- (Organizational / Institutional) = Rules, regulations, policies, and informal structures (schools, religious groups).

EXO- (Community) = Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

MACRO- (Social Structure/Policy) = Local, state, or federal polices and laws that regulate or support healthy action.

The purpose of this exercise was to investigate the accurateness of the researchers sorting of the obesity strategies into the SE Model level categories. The subject matter expert responses would provide evidence that would either confirm or refute the original categorization denoted by the researcher.

Data Analysis

Quantitative procedures were utilized as the primary method of data analysis. Within each section there were slightly different analytic approaches taken to best correspond to test items and the item-sorting requirements. Nonetheless, the primary calculations utilized were descriptive statistics, frequency analyses, and percentage of inter-rater agreement. All data were manually transcribed from the electronic survey host site to an electronic Excel document.

Section 1 Attitudes towards prevention. Descriptive statistics were calculated for the Section 1 item ranking data provided by the subject matter experts (Appendix M). Analysis of these calculations provided evidence of inter-rater agreement and content relevance as perceived by the judges. In addition to these data, a substantive analysis of the items revealed that terms such as *diagnosed* and *social agenda* within several items were evidenced to hold low inter-rater agreement. Based upon this combined analysis it was determined that such verbiages could lead to misinterpretation and therefore several items were reworded. Next, based upon the expert's rankings and interpretation of the item content, items were grouped into ranked categories. A cross-reference with the original attitude categories was conducted and this resulted in the retention of 28 items (Appendix M). Modifications and rationale of five of the Section 1 items are provided in Appendix N.

*Section 2: Locus of Control of Childhood Obesity***.** Descriptive statistics were calculated of the Section 2 participant response data. The statistical mean of the participant responses was the primary calculation used in the analysis. The mean value served to identify which dimension the subject matter experts perceived the item to best represent. As a result, it was determined that nine items fit within the Internality dimension, 8 in Chance and 13 in Powerful Others (see Appendix O). Taken this, a cross-reference of the experts' ranking and the original categories the items were written for was conducted. Results placed 11 items in dimension of Internality, 11 in Chance, and 9 items within Powerful Others (Appendix P). This set of items was then placed upon the Pilot Study B instrument with a response format included a 5-point Likert response scale with a sixth response option labeled "don't know".

Section 3: Solutions to Childhood Obesity. Analysis of Section 3 data included descriptive statistics. The primary calculations included mode and inter-rater agreement of the

placement of items within the given categories. The items that maintained at least a 70% inter-rater agreement were retained. Consideration was made for items that were consistently categorized within a different social layer category by the subject matter experts. In instances such as this, a qualitative evaluation of the item content was conducted to investigate potential interpretation. This substantive assessment of the items resulted in the re-categorization of eight items (see Appendix Q). At the conclusion of analysis of Section 3 data, ten items each consisting of the four solution options were developed. The four solution options were representative of the four SE Model social levels. Each of the ten items were reflective of similar content based upon the five CDC focus areas.

Phase II Summary

As a result of Phase II Item Construction (Benson & Clark, 1982) items were evaluated by a sample of subject matter experts (N =9) to provide evidence of the validity of the content of the items. The efforts of the experts provided feedback on the categorization of the items within each of the three sections and allowed for the number of items within each section to be reduced to a suitable number as well as honing the conceptual focus of each section. At the conclusion of Pilot Study A Section 1 was reduced from 31 to 28 items, Section 2 was reduced from 36 to 31 items and Section 3 was reduced from 81 to 40 items. The steps executed in this phase established a set of items ready to be administered to target group participants in the next phase. Pilot study participants in subsequent stages of this process will ascertain initial reliability estimates in accordance with meeting the stated objectives of the instrument.

CHAPTER 6

PHASE III: QUANTITATIVE EVALUATION

The third phase proposed by Benson and Clark encapsulates the beginning of item analysis and qualitative evaluation of the newly developed instrument. Carrying over from the previous pilot studies were the items reinforced by subject matter experts and target population participants from the pre pilot study. Phase III highlighted the preparation and administration of the provisional instrument to two groups of target population through the execution of Pilot Studies B and C (Benson & Clark, 1982). Quantitative analyses were the primary established methods utilized during this phase. This included descriptive statistics, exploratory factor analysis, and the computation of internal reliability measures of the instrument. At the conclusion of this third phase, a revised version was hypothesized ready for validation efforts.

Pilot Study B

The purpose of Pilot Study B was to continue providing evidence of validity of the item pool and establish preliminary evidence of internal reliability of the newly developed instrument. This was be accomplished by the distribution of the instrument to target group participants who completed the working version. Additionally, the participants responded to several overview questions at the conclusion of the instrument that related to the structure and content proposed on the survey. Responses from the debriefing questions were used to further ensure the appropriateness of the terminology and ideology remained consistent with the perceptions of parents as well as the theoretical base in which it was designed. This pilot study served critical in the development and progression of the instrument, below is an explanation of the steps taken in Pilot B.

Participants

A total of 98 parents participated in Pilot Study B. Similar to the format of Pilot Study A, there were two waves of surveys completed (Pilot Study B_1 and Pilot Study B_2). The first of which contained Sections 1 and 2 and the second consisted of only Section 3. This decision to have this pilot study be divided into two waves was due in large part to the extensive number of items within each section. The approximated time it took to complete each wave was 25 minutes. If both waves were to be completed concurrently, the composite time burden for each participant would have been approximately 50 minutes, which was deemed too long to ask participants within the context of regular meeting or event to agree to. Therefore, the waves were conducted separately. The two waves of participants are described below.

Pilot B_1. Participants of Pilot Study B_1 included 33 parents of school-aged (Pre K-College) children who volunteered to complete the working version of the instrument that included Sections 1, 2 and a brief demographic segment. Participants completed the instrument while attending one of three Georgia Parent Teacher Association (GPTA) events. The events included health fairs and physical activity-based fundraising events sponsored by the GPTA. These events were promoted most strongly via the GPTA, yet open to the public. Participant recruitment methods remained the congruent with the methods utilized in the Pre Pilot Study. Parents received an informational packet that included a letter explaining the study (see Appendix M) and the survey instrument. Consent was implied by the completion and return of the paper pencil survey.

Pilot B_2. Participants of Pilot Study B_2 included 65 parents of school-aged (Pre K-College) children. These volunteer participants completed the survey instrument including Section 3 and a brief demographic segment. Participants were recruited at two events, a youth

swim meet and a regularly scheduled GPTA meeting using the same strategies as described in Pre Pilot Study and Pilot B_1. Parents received an informational packet that included a letter explaining the study (see Appendix M) and the survey instrument. Consent was implied by the completion and return of the paper pencil survey.

Method

Collectively within both waves of Pilot Study B, 98 participants completed paper pencil survey instruments abiding by the specific directions stated for each instrument version. Appendices S and Z provide complete Pilot B_1 and Pilot B_2 instruments.

Pilot B_1. Participants responded to 28 dichotomous items in Section 1 and 33 Likert items in Section 2. The written directions provided to the participants were as follows:

> *Please respond to each of the following statements by placing a check mark in the appropriate box.*

In addition, the participants provided basic demographic information that included no identifiable information and a written debriefing section at the end of the instrument. The debriefing questions posed to the participants were included to provide candid feedback about the clarity of the items and directions of the instrument. The two debriefing statements included:

> *1) Were the directions of the survey you just completed clear? If not, please specify where by underlining the areas on the survey and provide rewording or clarification suggestions in the area below.*
>
> *2) Please review the survey items and circle any words or phrases that you had to read multiple times to understand the meaning or what you were asked to do.*

Upon completion of the survey instrument, participants returned the instrument to a folder or drop box near the researchers display table. There were no associations made between the respondents and the instrument they had just completed to ensure anonymity.

Pilot B_2. Participants responded to 10 items concerning prevention strategies to childhood obesity. Each item held four response statements that represented potential solutions and prevention strategies to childhood obesity as organized by the CDC and SE Model categories. The directions stated: *Please write a letter next to the four childhood obesity prevention strategies below to show your degree of support if they were to be implemented in your community. Use A for the strategy you would give greatest support, B next, then C, and D for the strategy you would least support.*

Participants also provided basic demographic information and completed a debriefing section at the end of the instrument. The debriefing section included the following three statements:

> *1) Please list any strategies that you did not see identified on the survey that you believe would be effective at reducing childhood obesity in your community.*
>
> *2) Were the directions of the survey you just completed clear? If not, please specify where by underlining the areas on the survey and provide rewording or clarification suggestions in the area below.*
>
> *3) Please review the survey items and circle any words or phrases that you had to read multiple times to understand the meaning or what you were asked to do.*

These questions were intended to provide additional feedback about the clarity of the items, directions of the instrument, and the perceived comprehensiveness of the strategies listed. Upon completion of the survey instrument, participants returned the instrument to a folder or drop box

near the researchers display table. There were no associations made between the respondents and the instrument they had just completed to ensure anonymity.

Data Analysis

Data from the Pilot B participants (*N*=98) were transposed manually into an Excel file with corresponding dichotomous (1=agree; 0=disagree), Likert (1=strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree), and rank ordered coding as per the respondents responses for each section (1= A greatest support, 4= D least support). From these data analysis of each section was performed separately, as each required unique analyses.

Section 1 Attitude towards Obesity Prevention. Thirty-three complete data sets used for analysis of the Section 1 data. Three values were calculated for each participant from the raw data collected from within Section 1. These values included (a) sum of items agreed, (b) weighted value of agreement, and (c) participant scores. The sum of items agreed with was the first value calculated. This was accomplished simply by adding together the number of items that were responded as 'agree' (code of 1). Appendix T displays the percentages of participant B_1 agreement of Section 1 items. The sum of items agreed with was necessary for the calculation of subsequent values and analyses. Next, response data were assigned a weighted value of agreement. This value was based on the item's original attitude ranking along the continuum and was accomplished by multiplying the original rank value to the dichotomous response of 1 or 0.

The third value calculated for this data set was a participant composite score. The composite score was computed by dividing each participant's sum of weighted values by the total number of items agreed. The participant score represented participant average numerical responses along the attitude continuum. Theoretically, if the items were truly interval, participant composite scores would be reflective of the attitude of support or opposition of childhood obesity

prevention programs. For example, composite scores between 1.0 and 3.0 would represent varied degrees of support of obesity prevention and scores of 5.0-7.0 would indicate opposition to obesity prevention. After the participant scores were calculated, the data set was analyzed based upon composite score and participant agreement of items along the continuum.

Findings Section 1. Based upon the data analysis of Section 1, findings provided evidence of the quality of written items and patterns of participant responses. First, it became apparent that participant tended to respond in agreement with contradictory attitude statements. This was clear in participant responses relative to items depicting support of spending and financial patterns to support obesity prevention. 81.8 percent of the participants agreed with the item *I do not know how much money is spent on childhood obesity prevention* and another 78.8 percent of the participants also agreed with the item that stated *Current spending on childhood obesity prevention is insufficient.* The contradiction lies here, if one does not know how much is spent on obesity prevention, then the agreement to a statement referring to the amount of spending would be inaccurate. Such evidence highlighted that items written in reference to the *knowledge of the issue* rather than *judgment/attitude toward the issue* were present and inappropriate for this section. This red flag assisted in the decision to omit the seven items from this scale that had been written to depict financial commitment and awareness.

Although the population sample for Pilot B_1 was small, the Section 1 items appeared to be suitability distributed across the seven continuum points. There was evidence of relative support to obesity prevention, as the range of participant composite scores was 2.2- 4.6 (on a 7 point scale). The implications of this narrow composite score range may be indicative of the health and activity-related contexts in which the sample participants were recruited. Additionally, the health values of Pilot Study B_1 participants may be homogenous due to the

propensity of parents who attend health fair and physical activity related events. This was acknowledged as a potential limitation to comprehensive analysis of all items within Section 1, particularly those representing opposition to obesity prevention.

Section 2 Childhood Obesity Locus of Control. Data were transposed from the paper pencil format to an electronic Excel spreadsheet and then again to a Statistical Program for Social Sciences (SPSS, (v16.0)) file. Data were cleaned, that involved the omission of incomplete data sets (i.e., non - responses in any item cell) and the re-coding of *Don't Know* response options to Neutral coding. The rationale for cleaning these data to ensure only complete data sets were used during this exploratory stage of instrument development. It was believed that omitting incomplete data and recoding would provide a clearer analysis. As a result, seven participant data sets were omitted from the Section 2 analysis due to non-responses, providing a sample *N=27*. The *Don't Know* responses were re-coded to a represent a Neutral value. There were no distinctive patterns or trends observed in the *Don't Know* responses.

Frequency analysis of response options. Following the data cleaning process, a frequency analysis of the response options was conducted. The purpose was to determine how frequently the five Likert response options were being used. Results indicated that all five Likert response options were satisfactory distribution of response options across the items in Section 2.

Principal components analysis. After the data were cleaned and it was determined that the response options were sufficiently represented in the participant responses, the remaining participant responses (*N*=27) were examined using a factor analysis technique called Principle Components Analysis (PCA). The primary purpose of PCA is to reduce the data into orthogonal (uncorrelated) principal components whereby the interrelationships among the original variables

are represented. The orthogonal principal components are then representative of the variability of the data.

To assure that a factor analysis using PCA was suitable for these data, two statistical tests were conducted (a) Bartlett's Test of Sphericity and (b) Kaiser-Mayer-Olkin test. Bartlett's Test of Sphericity assesses the correlation of the variables to establish if the variables were different enough to weigh on or measure multiple components (Bartlett, 1950). The Kaiser-Mayer-Olkin (KMO) test is an indicator of the strength of the relationship between the variables and also assists in testing the adequacy of the sample size (Kaiser, 1974). Both of these tests were conducted with this data, but due to the exploratory nature of this analysis and small sample size, the Bartlett and KMO tests were too small to record. However, to continue the investigation of this exploratory examination of the newly constructed items, the PCA factor analysis was pursued.

Total variance explained. The examination of the total variance explained with the PCA factor analysis was initially done allowing all 33 variables within the analysis. The PCA calculations reported total variance by means of eigenvalues, percent of variance, and cumulative percent of variance explained (Appendix U). These values assisted in the determination of which components should be retained for further analysis. The eigenvalues for each component represent the variance in all of the variables that are accounted for within that component (a.k.a. factor). Eigenvalues are evaluated by Kaiser Guttman rule whereby eigenvalues equal to or greater than 1.0 indicates that factor explains a substantial amount of the variance in the variables, and therefore holds merit in the analysis of the sample and shall be retained for subsequent analysis (Kaiser, 1974). Another strategy to determining the number of components to be retained is theorized by Cattell (1966). Cattell denotes an examination of the

data via a scree plot. Pilot Study B_1 data represented in a scree plot (Appendix V) displays the eigenvalues for each component in a visual graphic. Based upon suggestion by Cattell (1966) the number of components shall be selected based upon where the eigenvalues appear to level off to the right of the plot. That is, that minimal variance is further explained by the remaining components.

Through an examination of the variance accounted for by the Section 2 variables, and consulting the eigenvalues ≥1.0 and the scree plot, it was determined that 83.77% of the total variance was encapsulated in 11 components. Therefore, the decision was made to investigate the 11 components and to conduct an analysis variables loading onto the selected components.

Component loadings. The retained 11 components produced by the PCA factor analysis that accounted for 87% of the total variance were examined based upon the correlated variables within each component. The correlation values, more often termed loadings, of the components are depicted in Appendix W in a compressed table that displays only values ≥ 0.40 as recommended by Tabachnick and Fidell (2001). One primary objective of examining of variable loadings is to determine which variables are most correlated to the components that explain the greatest amount of variance. Unexplained variance is identified as error. A secondary purpose devised in component loading is to identify the commonalities among the variables loading onto specific components relative to content.

From these data, it was evident that variables loaded on multiple components. The PCA factor analysis emphasizes the orthogonal or uncorrelated nature of the components. Therefore, the first component possessed the greatest number of variables and explained the most variance (16.27%). Consequently, the second component had fewer variables and the second highest percent variance explained (13.09%), and so forth. Desirable findings would present simple

structure in the relationship between variables and components. This would allow for succinct interpretation of component groupings based upon high correlation/loading values on solitary components per each variable. These data, however, did not represent simple structure, as evidenced by a) moderate loading values and b) multiple variables correlating to numerous components. These findings provided evidence that a rotation of the data may be necessary.

Another finding supporting a rotation of the data, was that variables written to cluster together, based upon Wallston et al., (1978) locus of control dimension, were not demonstrating the desired consistency. In other words, there was a great deal of item correlations that were not written to associate with one another. For example, within two items that were moderately correlated/loaded to Component 1 were Item #28 *I believe children have control over their obesity* (r= .617) and Item #7 *School lunch officials influence obesity in children* (r= .508). These items had been originally written to represent two separate dimensions, of Internality (#28) and Powerful Others-Externality (#7). Due to these findings, it was determined that an orthogonal Varimax rotation of the data was appropriate.

Orthogonal Varimax rotation. The purpose of an orthogonal Varimax rotation (Kaiser, 1958) is to relax the emphasis that the PCA analysis has on the variables within the first component, by rotating the axis in which the data were analyzed. The Varimax rotation seeks to rotate the axis in such a way that linear combinations of the original components result in loadings to be maximized or minimized (Abdi, 2001). This was undertaken and the rotated components matrix are presented in Appendix X for the eleven retained components.

After the Varimax rotation, the loading values were again compressed to retain only values ≥0.40 (Tabachnick & Fidell, 2001). The simple structure of the components did increase, which was evidenced by the items loading on more distinctive components. Additionally, the

grouping of variables were more reflective of the dimensions they were originally written, and resembled the dimensions noted by Wallston and colleagues on the MHLC scale (1978).

Reliability

The next step in Pilot B analysis as positioned by Benson and Clark (1982) was to measure the reliability of the factor groupings. Two reliability measures were calculated, Cronbach's alpha and Alpha if deleted. Using the factors and item groupings from the rotation data, Cronbach's alphas were calculated to determine internal reliability of the resulting factors. A secondary calculation was Cronbach's alpha if deleted. This value identified what the component reliability value could attain to if particularly weak item were deleted. Due to the extensive exploratory nature of this phase of instrument development, the computed reliability measures will not be presented but the range of Cronbach's alpha values were .549-.790 across the first five components (56% of the total variance explained) and held an average of 4 items each. The data for last six components (37% total variance) will not be reported due to the low Cronbach alpha calculations. Due to reliability analysis of Section 2, twenty-two items were retained with no or only slight wording modifications. Eleven items were removed from the initial item pool.

Qualitative Data Analysis

Participant feedback to the debriefing questions during Pilot Study B_1 included semantic feedback and suggestions for word changes in Section 1 and Section 2. The limited number of responses did not allow for extensive analysis or interpretation, however based upon the data evident in Appendix Y, the items were reviewed and slight modifications were made on behalf of the feedback.

Section 3 Solutions to Childhood Obesity. The items in Section 3 were reviewed and the primary analysis conducted during Pilot B_2 was the application of the qualitative feedback provided from the participants. A complete listing of all qualitative suggestions provided by Pilot B_2 participants in offered in Appendix AA. All forty items were retained with only minor word choice and formatting modifications.

Summary

Within Pilot Study B, quantitative and qualitative data provided evidence from a sample population of 98 participants, for the retention and elimination items in Section 1 and Section 2. The descriptive statistics analyzed for the dichotomous response items in Section 1 resulted in the retention of 21 items, where as the use of exploratory factor analysis of the Likert response items in Section 2 data resulted in retaining as is or slightly modifying 22 items. While the factor analysis was conducted with this data set, it should be identified that the sample size was small, and therefore the factor analyses findings shall be used with caution and in recognition that these were very exploratory in nature. Ultimately, Pilot Study B provided participant responses to guide necessary modifications to the instrument in order to distribute a improved working version of the instrument to a larger pilot sample in Pilot Study C.

Pilot Study C

In continuation of the assessment of the individual items within this newly designed survey instrument, Benson and Clark (1982) recommend a third pilot test of the items, which will be termed Pilot Study C. Based upon the previous findings and modifications made during Pilot Study B, the instrument will again be distributed, completed, and analyzed in similar fashion in effort to further provide evidence of item and instrument validity and reliability.

Participants

Participants of Pilot Study C included parents (*N=2*85) who volunteered to complete the working version of the instrument at various events or meetings. The events included Georgia PTA, two local Parent Teacher Organization (PTO) meetings, local programs such as *Relay for Life*, and electronic snowball sampling technique. Participant recruitment and informed consent (Appendix BB) procedures remained consistent with the expectation of the addition of electronic survey distribution, in which the same informational letter was provided via electronically (see Appendix DD).

The advantage of utilizing the electronic snowball sampling technique during this phase of instrument validation was that it allowed a broader distribution of the instrument across the sample population and again it provided access to parents that the researcher previously could not attain. A significant advantage of electronic-based surveys is the enhanced response time of participant reception and completion of the survey as compared to paper pencil methods of completion (Meehan & Burns, 1997; Mehta & Sivadas, 1995). However, potential a limitation of electronic sampling is the constrained distribution to individuals who have access to technology in homes or public places (Eng, Maxfield, Patrick, Deering, Ratzan, & Gustafson, 1998). Further, literature has also indicated that age and gender-related differences in Internet use may affect participants reached through this sampling technique (Hayslett & Wildemuth, 2004).

Scholars have investigated the effects of completing surveys using various mediums, particular print versus computer-administered surveys. The consistency of participant responses between the two mediums have been investigated and found to have relative minimal variance in response (Bachmann, Elfrink, & Vazzana, 1996; Helgeson & Ursic, 1989; Mehta & Sivadas,

1995). Considering the noted benefits and limitations of electronic sampling the decision was made to continue both modes of survey distribution- electronic and paper pencil.

Method

Participants completed a paper/pencil (*n*=194) or electronic version (*n*=91) of the Pilot C survey instrument. Both formats of the instrument included four separate components: a) demographic (11 items), b) Section 1 *Attitude Toward obesity prevention* (21 Thurstone items), c) Section 2 *Locus of Control of Childhood Obesity* (22 Likert items), and d) Section 3 *Solutions to Childhood Obesity* (10 rank-order items). See Appendix CC and DD for samples of paper pencil and electronic instrument formats.

Data Analysis

Each response item, including the demographic section, was numerically coded into an Excel spreadsheet document. Two hundred and eighty five (*N*=285) data sets were transposed from the paper pencil or electronic format to an electronic Excel spreadsheet and then again to an SPSS (v16.0) file. All data were systematically analyzed quantitatively. The debriefing comments were also transposed into the document, which were later reviewed to contribute to the modifications to the instrument's directions, word choice, and response options. Based on the collective analysis of the qualitative and quantitative data, modifications to the instrument were made. The process of analysis of Pilot Study C is described below.

Demographics. Eighty three percent of the participants responding to Pilot Study C instrument were ages 20 to 50 years old. With the greatest percentage of individuals being between the ages of 41 and 50 years (44.1%), this was followed closely by participants of 31-40 years old (31.0%). The distribution of participant ages can be found in Table 6.1. The sample population for this pilot test was predominately female, whereby 79.0% of the participants were

females, 9.3% were males, while 7.5% did not indicate a sex on the response item. Racial distribution of this sample population was also skewed toward a predominance of White/Caucasian participants, as represented by 71.5% of the sample (*n*= 201). The second largest racial population represented was Black/African American participants at 16.7% (*n*= 47). Bi-Racial/Multi-Racial and Asian/Pacific Islander, Hawaiian participants represented 2.5% and 2.1% of the sample population. Educational attainment and annual family income were additional demographic items that were captured from the participants in Pilot Study C. This sample tended to be over representative of individuals with college degrees and family incomes greater than $90,000.

The resulting sample distribution of Pilot Study C appeared to be homogenous. This may be attributed to the events the researcher had access to for participant recruitment. Further, the electronic snowball sampling consisted of the distribution of an email to Georgia PTA coordinators, who then distributed the email to their membership and addition individuals of choice. Being that the point persons (GPTA coordinators) given the original email may have been within a particular demographic; those whom they associate with would most likely possess similar demographic profiles. The skewed distribution may have possible implications on the findings and outcome of the instrument.

Table 6.1

Pilot Study C Demographics (N= 285)

Age (in years)	*n*	%
20-30	12	4.3 %
31-40	87	31.0 %
41-50	124	44.1%
51-60	31	11.0 %
>60	8	2.8 %
No Response	7	2.5 %
Sex		

Male	26	9.3%
Female	222	79.0 %
No Response	21	7.5%
Marital Status		
Married	229	81.5%
Divorces	13	4.6%
Single	18	6.4%
No Response	7	2.5%
Race		
White/Caucasian	201	71.5%
Black/ African American	47	16.7%
Asian/Pacific Islander/Hawaiian	7	2.5%
Hispanic/ Latino(a)	0	0%
Bi-Racial/ Multi Racial	6	2.1%
No Response	8	2.8%
Educational Attainment		
Less than HS	1	.4%
HS or equivalent	15	5.3%
Some College	35	12.5%
College graduate	131	46.6%
Advanced Degree	77	27.4%
Annual Family Income		
<$20,000	10	3.6%
$21,000-30,000	20	7.1%
$31,000-40,000	12	4.3%
$41,000-50,000	18	6.4%
$51,000-60,000	17	6.0%
$61,000-70,000	10	3.6%
$71,000-80,000	25	8.9%
$81,000-90,000	6	2.1%
>$90,000	128	45.6%
No Response	21	7.5%
Parents	250	89.0%
Non Parents	11	3.9%
State of Residence		
Georgia	285	100%

Data Cleaning. To ensure that only complete data sets were included in the section analysis, care was taken in removing non-response participant data when including from the final analysis of Pilot Study C data. The criteria for omitting participant data included the presence of any non-response in any of the item cells within the particular instrument section. As a result, 44 incomplete (i.e., including non-response) participant data files were omitted from Section 1, 34 from Section 2, and 62 from Section 3 (see Table 6.2).

Table 6.2

Data cleaning results of Non Responses Pilot C (N = 285)

	Participants with missing data	Total number of participants	% of participants with ≥1 NA
Section 1	44	285	15.43%
Section 2	34	285	11.92%
Section 3	62	285	21.75%

Item-by-item frequency analyses of the non-response items for Sections 1 and 2 was conducted. Appendix EE and FF provide visual representation of non-response item frequency data. These data indicated that within Section 1, Item #19 was most often not responded to with 20 participants indicating non-responses. This finding was not particularly surprising as Item #19 was identified in the debriefing as an item that wording was problematic due primarily to the presence of the word *pragmatic*, which may not have represented everyday language.

The next greatest non-response items in Section 1 were #13 and #14 with twelve non-responses each. After reviewing Item #13 there appeared to be multiple issues with the statement that could account for the number of non-responses. As it was originally written, the phrase

treatment of diagnosed was intended to represent non-preventative action, or in other words waiting until a problem presented itself and then choosing to treat known cases rather than working to prevent. This interpretation of the phrase did not appear to come across in participant responses. Rather the lack of clarity must have provided reason for the non-responses. Within the large number of non-response to Item #14, *There are more important social issues that deserve attention before childhood obesity* suggested that the statement was too vague for a definite response.

Item-by-item analysis of the non-response data of Section 2 revealed that Item #10 was least frequently responded. However, it should be noted, that no single item exceeded a non-response percentage of 4%. With this, it was deemed that the non-responses in Section 2 were due to participant error and not due to confusing or ill worded items.

Data Analysis Section 1

The objective of Section 1 remains to measure parental perceptions of obesity prevention. After the non-responses items were identified and the data were cleaned, Section 1 retained *n*= 241 participant data sets of the dichotomous responses. Data calculations were the same as in Pilot B, in which the following three calculated values were computed: a) sum of items agreed, b) weighted value of agreement, and c) composite participant scores. These data were transposed into an Excel spreadsheet and assigned numeric codes based upon agreement (code of 1) or disagreement (code of 0). Appendix GG reveals the percent agreement of Section 1 items, which appeared consistent with Pilot Study B data of the agreement bias toward items ranked in support of obesity prevention.

Participant composite scores. The average participant score of the *n*= 241 was 2.60 (range, 1.67 to 4.00). Based upon a seven-point scale, this narrow range indicates that the majority of participants responded in agreement to items that depicted support of obesity prevention. This data provided evidence of limited variability in participant attitudes. To evaluate participant item response in relation to individual composite scores, the data sets were organized by composite score and item agreement . According to Thurstone and Chave (1928) participant item response should coincide with the composite score. For example, a participant with a low composite score, should have responded to items with low associated values (i.e., 1, 2, and 3) and likewise for high composite scores (reflecting agreement with items with values of 5, 6, and 7). Yet, these data did not reflect the proposed response trend.

Rather, what transpired was only 23 % of participants with a low composite score (i.e., in support of obesity prevention) noted agreement with the attitude statements were written to illustrate support of obesity. Further, nearly all participants with high composite scores (i.e., in opposition of obesity prevention) responded in agreement to a large range of the attitude statements, representative of both opposition and support. This is not desirable nor does it correspond with the item format theory depicted by Thurstone & Chave (1928) wherein narrow range of attitude category agreement would correspond with composite scores. What can be concluded, is that the items may not have been representative of interval attitude categories or were not different enough to require contrasting responses to antagonistic items.

When examining the interval nature of the written attitude statements along the continuum, one would expect that antagonist items at the opposite end of the continuum to be responded to in opposition (i.e., agree with one, disagree with the other). Evidence of this would suggest that items are interval in nature. Participants then could identify with an attitude

statement along the continuum but then must disagree with opposite end of the spectrum items due to the contextual contradictions of the items. For instance, if a person would agree with the statement *I would gladly embrace prevention programs if implemented in my community,* then they should disagree with the statement *I would not support prevention programs implemented in my community.* The data however revealed that participants did not consistently respond in this fashion. Rather many participants agreed with contradictory statements on the continuum.

An interesting note related to neutral item response was that agreement with the neutral attitudinal statements was made by less than 2% of the responses (1.60%). Further, the neutral responses were selected by only one quarter of the total respondents, indicating that the neutral response option was not overused and identified that the composite scores were truly indicative of the support or opposition of the issue and not merely neutral item agreement.

Qualitative Data Analysis

Qualitative feedback provided within participant debriefing comments proved to highlight several critical elements of Section 1. In addition to word choice and item clarification, of most significance to the integrity of the section were the comments providing insight to the response format and the quantity of similarly worded items. One element brought to focus by the qualitative comments of the participants was the restrictive nature of the dichotomous response format. Although the response format had been strategically selected to measuring attitude of a one-dimensional construct, participant comments such as *could have used an additional choice-there was no gray area* (Participant #119) suggested that the dichotomous response option was not suitable for this issue. Further, responses pointed to the utilization of Likert response for the stated items as noted in these comment: *... Section 1 should have had more a continuum like section 2* (Participant #169) and …w*ould have liked a neutral for 1st section* (Participant # 121).

The persistent request of additional response options validated the sentiment that the dichotomous format was not suitable for this topic. Another respondent offered an on-target comment addressing the objective of the section and proposed a solution to the limitation of the response format. Participant #164 stated:

> *Section 1 If the question you want to answer is how committed I would be to support programs- then ask for a ranking- 1to 5 not committed to very committed*

The interpretation of this comment provides that the collection of items in Section 1 were not cohesive enough to translate the purpose of the section, leading the researcher to further see the multi-dimensions represented in the item content, a vast short-coming of the section.

Another element of Section 1 noted by respondents in their qualitative feedback was the quantity of items, specifically respondents commented on the like-nature of the items in Section 1. Comments such as [You were] a*sking the same questions again and again … was frustrating"* (Participant #212) portrayed an emotional reaction to the number and content of particular items, also demonstrated in the following comment: [Items] *should have been stated clearly <u>one</u> time!* (Participant #169). The repetitive nature of the items was systematic in this stage of development, as an effort to distinguish which set of items were most consistently responded to by sample participants. While having multiple items within each stratified category was critical to this stage of instrument development, the participants were not aware of this strategy and responded to this tactic in relative frustration. Table 6.3 presents additional participant comments referring to Section 1.

Table 6.3

Qualitative Feedback Section 1

Too many redundant questions (Participant. #169)
Questions were very repetitive (Participant #159)
Section 1 should be more clearly defined on the answers and in a consistent manner. Many were worded confusing and had to be re-read (Participant #113)
Asking the same questions again and again, but adding "no" and "not" to make you change your answer was frustrating (Participant #212)
I would suggest using far fewer questions (Participant #163)

Summary

The attempt was made to write interval-based items that would measure participant attitudes toward obesity prevention. Through Pilot Study C, it became apparent that limited variability in participant responses, which was evidenced through a narrow composite score range. An interpretation of this might have been reflective of the homogenous sample population and values held by particular demographic populations. The evaluation of participant responses relative to their composite scores indicated inconsistencies and great variability in the attitude statements agreed. It was concluded that poor item wording and potential non-interval based items were the culprit of these findings. Further investigation of the high frequency of participant agreement with contradictory statements was also indicative of poor quality items that introduced multiple dimensions beyond support /opposition to obesity prevention- which is in contrast to the intention of Thurstone and Chave (1928) item format.

Additionally, qualitative feedback provided by Pilot C participants indicated the restrictive nature of the dichotomous response format. Based on these findings, it was determined that substantial modifications to this scale were necessary to enhance the scales' ability to measure attitudes of support to obesity prevention. Therefore, the decision was made to omit Section 1 items from subsequent versions of the survey instrument.

Data Analysis Section 2

The cleaned data (*n*= 251) of Section 2 data were analyzed with exploratory factor analysis to investigate how the variables/items that were written to represent locus of control of childhood obesity. In addition to exploratory factor analysis of the variables, reliability measures of the components were calculated.

Frequency analysis. A frequency analysis of the response options was conducted to determine if all five Likert response items were being selected by the participants. Results indicated that participants utilized all Likert response options for all 22 items in Section 2. This indicates that the items were responded to along the five attitude options- that is, it was satisfactorily representative of the five attitude options.

Permission slip tests for exploratory factor analysis. After the data were cleaned and it was determined that the response items were sufficiently represented in the participant responses, the remaining participant responses (*N*=251) were analyzed to explore if a factor analysis was suitable for these data. The analyses conducted to identify if a PCA analysis would be appropriate for these data were the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. Results from these two tests are identified in Appendix HH and indicated "passing" scores with a KMO score of .744, which according to Kaiser (1974) as a *middling* value, one of moderate strength, yet suitable to proceed. These data coupled with the guidelines proposed by Gorsuch (1983) that a minimum of 5 participant responses per item provided evidence of adequate sample size. The Bartlett test score revealed a *p-value* of significance of .000, which suggests there is variance between the components/factors, and therefore identifies subsequent analysis should be conducted to determine just how much

variance there is between factors. As a result, a factor analysis of these data using the Principal Components Analysis was conducted

Correlation matrix. Next, the data were reviewed to identify correlation evidence between items. Data were compressed to only maintain correlation values greater than 0.40 were reported at *high* correlations (Tabachnick & Fidell, 2001). Appendix II identifies the Compressed Correlation Data from Pilot Study C which indicates eight item pair correlations with moderate to high correlation values. Item correlations are indicative that there is some relationship evident between items, hence hinting at item grouping and potential factor building. An example of two correlated items evident in the data was items depicting other people in children's lives to have control over their health, where a correlation of .574 was calculated between *A child's obesity is the result of decisions made by other people in their lives* and *Parents are responsibility for the obesity in their children.* The link between these two items seems to be more than quantitative, but also qualitative in the content presented in the item as well. Evidence of such correlations provide support for subsequent investigation of factor analysis.

Total variance explained. Due to the evidence of the KMO and Bartlett tests as well as the correlation data, a Principal Component Analysis factor analysis of the Section 2 data was conducted. When allowing for twenty-two of factors in this analysis in order to see how each variable contributed to the total variance, there were eigenvalues and cumulative variance explained calculated (see Appendix JJ). When the eigenvalues ≥1.0, that represented variances were retained, 58.22% of the total variance was explained with six principal components.

However, due to the latency of this construct another piece of evidence that helped to identify the number of components was the scree plot (Appendix KK) indicated that the retention of five components may be sufficient. This finding is in agreement with the values of variance

explained in similar instruments (Hardus et al., 2003; Covic et al., 2007), therefore was deemed suitable for this explorative analysis. The scree plot displays the eigenvalues for each component in a visual graphic and based upon suggestion by Cattell (1966) the number of components shall be selected based upon where the eigenvalues appear to level off to the right of the plot. That is, that minimal variance is further explained by the remaining components. Weighing these pieces of evidence indicated that insignificant amount of variance were accounted for when more than five components were retained. Therefore, the decision was made to retain five components, which accounted for 53.68% of the variance. The low value of explainable variance is attributed to the difficulty of capturing the latent construct of locus of control. The preliminary factor loadings were evaluated with the component matrix, with five components.

Component matrix. A review of the five component matrix of the variable loadings indicated which variables were significantly correlated to the retained components. The resulting structure of the matrix did not represent simple structure, or clean groupings of highly correlated items. Rather the matrix (Appendix LL) revealed moderate variable loadings on multiple components. In order to investigate how the explained variance could be maximized, the principal component values were rotated using an orthogonal rotation exercise called Varimax rotation. This type of rotation executes the rotation of the data to maximize the amount of variance explained by the newly loaded upon fact. This is accomplished by adjusting the regression line to a line of best fit as to maximize and minimize moderate loaded items from the previous PCA component matrix.

Orthogonal Varimax rotation. The orthogonal Varimax rotation allows for variable loadings to release the attraction/cling on the components they correlate to during the PCA analysis. As a result, the adjusted regression line allows increases and decreases in moderately

correlated variables. The orthogonal rotation allowed for eigenvalues and loadings to be adjusted, while maintaining the cumulative percent of variance explained by the components (53.68%). Table 6.4 provides the eigenvalues, percent of variance and cumulative percent of variance obtained before rotation with the Initial Eigenvalues columns and post rotation in the Rotation Sums of Squared Loadings column. Ultimately, this process assisted in achieving simple structure and providing clear variable/item groupings within the identified components.

The rotated component loading values reduced to loading values ≥.40 (Tabachnick & Fidell, 2001) is presented in Appendix MM. The orthogonal rotation was successful in producing moderately strong loading values among variables/items that were originally written to group together based on the Wallston, Wallston and DeVellis (1978) locus of control dimensions. Due to these initial observations, reliability measures were calculated on the variable groupings.

Table 6.4

Pilot C Orthogonal Varimax Rotation Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.156	18.893	18.893	4.156	18.893	18.893	2.936	13.346	13.346
2	2.828	12.855	31.748	2.828	12.855	31.748	2.577	11.714	25.060
3	1.846	8.392	40.140	1.846	8.392	40.140	2.533	11.515	36.574
4	1.674	7.609	47.749	1.674	7.609	47.749	2.058	9.353	45.928
5	1.305	5.934	53.682	1.305	5.934	53.682	1.706	7.755	53.682
6	1.006	4.573	58.255						
7	.971	4.414	62.669						

Extraction Method: Principal Component Analysis.

Reliability

Reliability has been defined as "the consistency or repeatability of a measure" (Thomas & Nelson, 1996, p. 220) and can be measured using a variety of methods, including Cronbach's coefficient alpha (Aiken, 1997). For this data set, Cronbach's coefficient alpha and alpha if deleted were two reliability measurement techniques calculated to determine the patchiness of the items within the suggested ten components

Cronbach's alpha and alpha if deleted. Using the item clusters gathered from the orthogonal data rotation, five components were analyzed to determine the strength of the item groupings as measured by Cronbach's Alpha. Additionally, a measure of alpha if deleted was calculated to highlight the internal reliability of the factors, and the possibility of items being omitted or eliminated from the particular component in order to strengthen the reliability of the variable groupings. According to Nunnally (1978) a desirable alpha value indicative of high reliability to be .70 or better. Therefore, the reliability calculations that follow were driven by the attempt to have the data represent a Cronbach's alpha value greater than .70.

Component 1- Internality. As per the orthogonal Varimax rotation, the component holding the greatest percent variance (13.34%) consisted of 7 items and held a calculated Cronbach's Alpha of .749 (see Table 6.18). All of the items originally denoted in Component 1 were evidenced to contribute substantially to the factor, even after item-total statistics were calculated. Therefore, the decision was made to retain all variables within Component 1. Upon further analysis of the Component 1 item content there appeared consistencies in the integrity relative to the Internality dimension as posited by Wallston et al. (1978) from their MHLC scale. Conceptually the items with the Internality factor represented the notion that the individual child had control over their obesity by way of their actions or behaviors. This was evident by phrases

enveloped in these factors items such as *a result of his/her behaviors*, and *is what they do*, and *children have control*. This conceptual representation of the Internality factor will be further assessed in the subsequent pilot tests.

Component 2- Chance Externality. Five items loaded strongly on the second component measuring 11.7% of the total variance, held a Cronbach's Alpha of .675 (see Table 6.18). Item-total statistics for Component 2 indicated that the deletion of any item of the collection would not substantially increase Cronbach's Alpha of Component 2, therefore all items were retained. In addition, analysis of the items content revealed the compilation of items constant with another MHCL dimension of Chance- Externality (Wallston et al., 1978). Taken together the Chance items embody the notion of no fault and no blame in the consideration of childhood obesity development, as if it were by luck or fate that children are obese. Terms such as *chance* and *if it is meant to be* appear to encompass the factor reinforce the structure of the Chance factor.

Table 6.5

Pilot C Item Factors and Loadings

Component 1 *Internality*	*Factor*
Cronbach's alpha = .749 (13.34% total variance)	*loadings*
1 If a child is obese, it is a result of his/her own behaviors.	.701
13 The main thing that affects a child's obesity is what they do.	.541
14 When a child is obese, he/she is to blame	.699
18 A child cannot be to blame if he/she is obese.	.624
20 I believe children have control over their obesity.	.639
21 Children are in control of their own weight.	.730
22 A child's behaviors are not the reason for their obesity.	.428
Component 2 Chance- Externality	
Cronbach's alpha = .675 (11.71% total variance)	
6 It is by chance that some children are obese.	.694
7 If it is meant to be, my child will become obese.	.744
10 I cannot believe that chance is the cause of obesity in children.	.415
15 No one is to blame when a child is obese.	.498

19 No matter what obese children do, they will always be obese.	.698
Component 3 Powerful Others- Inside the Home	
Cronbach's Alpha= .698 (11.51%total variance)	
2 Parents should not be blamed for obesity in their children.	.439
8 A child's obesity is a result of decisions made by other people in their lives.	.723
9 Parents are responsible for the obesity of their children.	.717
Component 4 Powerful Others- Outside the Home	
Cronbach's alpha = .726 (9.35% total variance)	
11 Fast food restaurants are responsible for childhood obesity.	.861
12 The mass production of food in the U.S. is a primary cause of obesity in kids.	.880
17 Television programs targeted at children contribute to obesity in kids.	.631
Component 5	
Cronbach's Alpha= -.057 (7.75%total variance)	
2 Parents should not be blamed for obesity in their children.	.574
4 Genetics is a primary cause of obesity in children.	-.644
5 I don't believe other people control the obesity of children.	.559

Component 3- Powerful Others Inside the Home. Initial analysis of the seven items within Component 3 accounting for 11.51% total variance revealed a very weak alpha value of .079. Item-total statistics and Alpha if Deleted values revealed that if several of the items were to be deleted, there would be substantial increases in the reliability coefficient. Through a systematic identification of items suppressing the potential reliability of the factor, three items emerged as a strong grouping within Component 3, as evidenced by alpha of .698 as well as the similarity of the item content. The remaining items of Component 3 were evaluated for their conceptual similarities and it became evident the dimension of *Powerful Others* presented by Wallston and colleagues (1978) that involved the influence of external to the individual, such as doctors, parents, or family members influencing one's health. The items held within this Component appeared to reinforce the concept of Powerful Others; however, this grouping consisted only of the items that depicted influences within a child's home. While Wallston,

Wallston and DeVellis had not made specific indications of contextual specificity of others influencing health, the respondents in this pilot study indicated a distinct separation of this dimension, as will be seen in the next component, adding an enhanced degree of specificity. Implications for this division may highlight the difference between health locus of control and the attempted measure of childhood obesity locus of control. Further investigation of this Powerful Others Inside the Home factor may provide insight to how parents perceive the complexities of childhood obesity and how *powerful others* insight and outside the home discretely influence the development of obesity in children.

Component 4- Powerful Others Outside of the Home. The fourth component possessed three strongly loaded items with a collective Cronbach's Alpha of .726. These items accounted for 9.35% of the total variance and again depicted item-statistic calculations that would not sufficiently increase the alpha value. There was one item was indicated that if deleted could enhance the reliability to .799. However, after a substantive analysis of the items, it was clear that #17 should remain within the Component structure. Further evaluation of this fourth component again offered suggestion of Wallston, Wallston and DeVellis's (1978) *Powerful Others* dimension. Yet, this grouping of items appeared to be entrenched in powerful influencers on the larger scale- representing fast *food* and *television programming* as stated elements of childhood obesity development. Therefore, this component was titled Powerful Others Outside the Home, which again emphasized a specificity in the context of which others may influence obesity development. A limitation to this component is the small number of items that represent this factor.

Component 5 -Unnamed. The final component retained for evaluation included only three items, but did account for nearly 8% of the variability. The reliability statistics of Component 5

in Table 6.18 revealed a very weak and negative Cronbach's Alpha of -.057. Subsequent the item-total calculations produced two Alpha if Deleted values that reflected strong, but again negative alphas if Items #2 (Parents should not be blamed for obesity in their children) and #5 (I don't believe other people control the obesity of children) were deleted. Interestingly, the data indicated that if Item #4 (Genetics is a primary cause of obesity in children) were to be deleted, the overall Alpha value for the Component would equal .677. This significant increase in alpha values if Item 4 was deleted from this component, presents an interesting situation, in that Item 4 was the only item written to represent the concept of genetics as a factor influencing childhood obesity locus of control. While there appears to be a growing body of literature suggesting genetics as a factor to be considered in the development of childhood obesity (Comuzzie & Allison, 1998; Edenberg & Foroud, 2006) it would seem important to include an item related to this issue in the survey instrument measuring parental perceptions of locus of control.

Evaluating the three items' content collectively, indicate that participant's responses place significant importance on genetics, while not identifying others in children's lives (i.e., parents) to be responsible for obesity. The genetics item was originally written to fit within the Chance dimension- as it is not the fault of the child or the parents, but in this analysis it appeared that participants did not identify genetics as chance, but as something separate and unique. Therefore, while the reliability measures are unstable, the decision was made to retain all three items in this component and see how these items would react in subsequent pilot test.

Qualitative Data Analysis

Respondents provided qualitative feedback relative to instrument clarification and proposed item modifications. Feedback assisted in changes to three items and the deletion another. The summary of decisions made based upon participant qualitative feedback are

illustrated in Appendix NN. Common changes to items including the restructuring of the words to enhance the clarity and readability of the items. The vagueness of Item #3 *Someone or something is responsible for obesity, not luck* was regularly identified by participants and therefore, the decision was made to remove that particular item from the instrument.

Summary

As a result of the exploratory factor analysis of Section 2 data, five components were retained accounting for 53.682% of the total variance. Four of the five components appeared to be consistent with the theoretical framework presented by Wallston, Wallston and DeVellis (1978). Reliability calculations of the components assisted in the further retention and deletion of items to further strengthen the individual components.

Section 3 Solutions to Childhood Obesity Data Analysis

The Section 3 data for analysis included *n*=219 complete participant data sets. Data was cleaned to remove any incomplete or incorrectly coded data sets, resulting in the omission of 62 sets of data. Preliminary analysis included descriptive statistics of the rank-order data. The data were coded in a fashion in which low values indicated highest ranking (i.e., A=1st choice, B=2nd, etc; that was then transposed into electronic form of 1st choice = 1; 2nd choice= 2, etc.). The descriptive statistics provided a sketch of the types of programs and at which social level (as per Social Ecological Model) this sample of participants would support if implemented in their communities. While an acknowledged limitation of these data is that the pre-selected items on the survey were not equal in quality, cost, or burden, yet the respondents were required to rank them as though they were. The findings of these analyses are described below.

Descriptive statistics. Data reduction occurred by calculating descriptive statistics. The calculated mean of the sample responses established the average ranking of the selected strategy

within the four identified SE Model categories. To supplement the mean values of each solution, the calculated mode provided an awareness of which value (A, B, C or D) was most frequently identified for each selection option. The mean and mode values were used in concert to depict which solutions were most favored by this sample (see Appendix OO). Section 3 items were then evaluated by reviewing the descriptive statistics of the rank-ordered data in relation to the content and social context of the solution items. The findings will be presented in order of the five focus areas described by the CDC *Healthy People* initiative: a) Educational and community-based programs, b) Environmental health, c) Access to quality health services, d) Nutrition and overweight and e) Physical activity and fitness.

Educational and community-based programs. The participant responses to solutions representing the Education and community-based programs focus area indicative of educating people about obesity and obesity prevention were most supported within the SE Model context of the Institution. Responses to the options in Item #1 reveal that the Institutional focused strategy *Enhance PE classes with information about the outcomes associated with obesity* received a mean ranking of 1.64 (*SD* =0.90) whereas the least favorable strategy focused on educating parents stated as *Develop online parent forums about obesity prevention* at the Interpersonal SE Model level (*M*=3.17, *SD*= 0.95).

Responses to Item #2 describe the agreement of sample participants in the application of educational based programs at the Institutional level. The strategy *Increase physical activity opportunities for children within the structure of the regular school day* received a mean ranking of 1.25 (*SD*= 0.42), which was consistent again as a strategy within the regular school day. The strategy given least support by this sample was *Activity promotion delivered by Internet advertisements* (*M*=3.66, *SD*= 0.54) that was written to reflect the Community SE Model level.

These data exhibited that the Institutional SE Model level was most frequently identified as the context of implementing educational-based programs. Additionally, the specific types of strategies noted in the least favored response options both lean toward online or internet based efforts- which parent responses to this instrument are identified as being of least value.

Environmental health. Environment health at first glance did not appear to have significant influence on obesity development, while indirectly there are numerous implications for this. Pilot Study C respondents to Item #3 identified the Community as important for integrating programs focused on Environmental health. The strategy capturing greatest support that stated *Provide more parks and recreation supervised programs for children* (*M*=1.56 *SD*= 0.96). Whereas the least supported strategy in this grouping was at the Institutional level which included *Hir[ing] additional school nurses to track obesity development in students*.

Item #4 posed another grouping of selection options relative to Environmental health, where respondents identified the strategy: *Public programs and funds to improve walking and biking trails* within the Social SE Model level (*M*=1.70 *SD*=1.01) to be most favorable. Coming in as a close second was the Institutional based strategy that included schools to be open longer hours for physical activity participation. Of least support was the strategy depicting the development of a community-based surveillance program (*M*=3.29). There remained consistency in the types of programs that would be supported and opposed. Participants identified the enhancement of parks and recreation services as probable means of solving obesity. However, there was substantial opposition to the strategies that involved health and obesity surveillance. These themes provide insight to the instrument's ability to distinguish parent support and opposition of explicit solutions to childhood obesity.

Access to quality health service. Among the obesity prevention strategies representative of *Access to quality Health Services*, sample respondents identified greatest support for initiatives implemented at the Community and Interpersonal SE Model levels within the two sets of item responses. The first grouping of response items (Item #5) representing this focus area, revealed that parents would be most likely to support a strategy implemented at the Community level (*M*=1.79, *SD* = 0.90) which was stated as: *Offer inexpensive community-wide programs promoting obesity prevention.* The strategy reported to receive least support in this grouping of responses was at the Institutional level (*M*=3.37 *SD*= 0.70) stated as *Computerized obesity tracking program managed by school nurses*.

Within the second grouping of Access to quality health services items (Item # 6) the strategy receiving greatest support represented the Interpersonal level (*M*=2.02, *SD*=0.99) *Child counseling on prevention of obesity by trained instructors* and the least favored strategy *Community-wide obesity risk assessment and screening* represented the Community level (*M*=2.90 *SD*= 0.96). Evidenced by the mean values of all four response options in this grouping falling within a range of 2.02 and 2.90, it was apparent that there was not an overwhelming strong agreement of the greatest and least supported strategies in this grouping.

The two items within each grouping receiving the least favorable rankings both involved some component of childhood obesity screening or tracking – with the primary difference of which social level it was conducted. This finding is significant interest in that it reveals regardless of social context, parents do not perceive obesity surveillance programs to be effective strategies to prevent or combat childhood obesity.

Nutrition and overweight. The descriptive statistics of the Nutrition focused strategies indicated that in both sets of selection items, the Institutional SE Model level was identified as

most favorable for program integration. Within Item #7, the strategy providing evidence of greatest support across the sample with a mean value of 1.50 (*SD*=0.73) stated *Modifications to school meals – reducing sodium, sugar, and fat content*. Similarly, within Item #8 the selection choice categorized within the Institutional level was again identified as garnering greatest support- *Prohibit junk food or sugary sweets to be brought into school classrooms* (mean 1.98, SD=0.94). The selection items within both Items #7 and #8 were captured within the Social level and presented the option of increased legislation for research (*M*=3.25) and increased tax on high fat foods (*M*=3.52).

Physical activity and exercise. Responses associated to solutions in the focus area of Physical activity and exercise suggested extreme ends of the SE Model level to be favored. In Item #9 the selection choice deemed to be most supported was situated within the Interpersonal level, as the item involved parent engagement in physical activities with their children (*M*=1.90). Responses to Item #10 however, indicated that effort at the Social level to increase the number of public parks and recreation areas (*M*=1.85, *SD*=0.99) would be of greatest value to the sample. Sample participants agreed in both #9 and #10 that strategies implemented at the Institutional level would be given least support, as shown in the television viewing reduction program based within the school (*M*=3.14, *SD*=0.99) and family focused exercise classes provided by religious groups (*M*=3.13, *SD*= 0.76) receiving lowest rankings in both selection groupings.

Qualitative Analysis

Qualitative feedback for Section 3 items was offered by 58 participants. A complete listing of the debriefing responses is presented in Appendix PP and include suggestions of potential solutions to childhood obesity that were not present on the Pilot C instrument. The feedback was analyzed based upon content and frequency of at least 10% of the participants

identifying it as a solution. Additionally, debriefing feedback from participants assisted in the enhancement of word choice to Section 3 items, decisions and rationale for item modification IS presented in Appendix QQ.

Summary Section 3 Solutions to Childhood Obesity

What can be surmised from the analysis of Section 3 is that the item format and response format of rank ordered responses is suitable in identifying trends in content and context obesity solutions supported by participants. Trends specifically focusing on education and nutrition appeared to be most supported within the Institutional context, particularly in educational institutions. Further, participants responded in opposition to solutions involving surveillance or tracking of obesity development at any social level. The application of these preliminary descriptive findings, coupled with the qualitative feedback contributed to the improvement of item clarity for the next pilot test.

Summary of Phase III Quantitative Evaluation

Benson and Clark (1982) proposed that quantitative analysis is required to establish preliminary validity and reliability of newly developed instruments. The step taken within Phase III tested the stability and strength of the items, while striving to uphold the purpose of this instrument: to measure parental perceptions of a) locus of control and b) solutions to childhood obesity. The two pilot studies, Pilot Study B and C executed within this phase provided response from participants (N=384) to produce a robust set of items that appear to represent five factors that coincided with the locus of control framework of MHLC (Wallston et al., 1978). Further, preliminary findings provide evidence of trends relating to parent perceptions of specific solutions to childhood obesity. As a result of Phase III, the dichotomous set of items in Section 1 Attitudes of obesity prevention, have been deleted from the survey instrument. Additionally,

slight modifications were made to the survey instrument and preparations were made to redistribute the improved instrument to participants in the final Pilot Study D.

CHAPTER 7

PHASE IV: VALIDATION

The final phase proposed by Benson and Clark (1982) is the Validation phase that served to establish preliminary evidence of validity of the newly developed instrument. In this phase the final pilot study, Pilot Study D was undertaken. The steps within this phase included preparing the instrument for distribution and conducting factor analysis and reliability calculations of the collected data. Such quantitative analysis provided evidence of the instrument's ability to measure the stated objectives. The steps executed through Pilot Study D and associated findings are described below.

Pilot Study D

The reiterative process of instrument development (Benson & Clark, 1982) required the facilitation of multiple pilot tests of items to substantiate the validity of the newly developed measurement tool. The fourth and final pilot test, titled Pilot Study D, assessed the instruments ability to capture the latent construct of parental perceptions of a) locus of control and b) prevention strategies to childhood obesity. The findings from this analysis will provide a quantitative evaluation of the instruments ability to measure the proposed objectives.

Participants

A total of 227 parents participated in Pilot Study D. Strategies for participant recruitment involved face to face recruitment at a youth swim program function (n= 25) and electronic snowball sampling technique (n= 202). The snowball sampling approach was utilized to locate information-rich key informants (Patton, 1990) who would not have been accessible to the researcher. This was accomplished by contacting several potential parent respondents associated with the Georgia Parent Teacher Association, local churches, parent groups, civic organization

such as the Junior League, and child development centers in the Southeast and requesting for these contact to pass along the electronic survey link to potential parent respondents. A by-product of utilizing the snowball sampling technique was that geographic sample extended outside of the area of previous pilot test participants that is, beyond the state of Georgia. This was not viewed as a limitation, but as a strong point chiefly because the instrument was not designed solely for citizens of the state of Georgia, but for parents wherever they reside.

Participants completing the paper/pencil format received an informational packet that included a letter explaining the study (see Appendix RR) and the survey instrument. Consent was implied by the completion and return of the paper pencil survey. Participants completing the electronic format received an electronic link to the survey, which included the informational letter embedded at the start of the survey (Appendix TT). Consent was implied by the completion and electronic submission of the survey.

Method

Participants completed the instrument in either paper/pencil or electronic format via an anonymous electronic survey host (www.surveymonkey.com). Based on previous pilot testing completion time of the paper/pencil instrument version was approximately 15 minutes whereas the electronic format completion time was estimated 5-7 minutes. For a complete listing of Pilot D items and participant instructions see Appendix SS (paper/pencil) and TT (electronic).

Data Analysis

Each response item, including the demographic section, was numerically coded into an Excel spreadsheet document. Two hundred and twenty seven (N=227) data sets were transposed from the paper/pencil and electronic format to an electronic Excel spreadsheet and then again to an SPSS (v16.0) file. Negative coding for the four Locus of Control items was completed. All

data were systematically analyzed quantitatively using unique analyses for each of the noted sections. Based upon the procedures and analyses of Pilot Study D the descriptions of findings are presented.

Demographics. The demographic profile of the 227 participants in presented in Table 7.1. The majority of the participants were female (72.2%), parents (87.2%) and married (84.1%). The primary age range identified was 31-40 years (48%) with a range 20 – 60 years of age. Nearly three quarters (74%) of the sample were tertiary educated and 77% reported annual family incomes greater than $51,000 (range, <$20,000- >$90,000). The majority of participants identified themselves as White/Caucasian (87.7%) and residents of the state of Georgia (66.9%).

Table 7.1

Pilot Study D Demographics (*N*= 227)

Age (in years)	*n*	%
20-30	17	7.5%
31-40	109	48.0%
41-50	54	23.8%
51-60	21	9.3%
>60	7	3.1%
NA	19	8.4%
Sex		
Male	35	15.4%
Female	164	72.2 %
NA	27	11.9%
Marital Status		
Married	191	84.1%
Divorces	11	4.8%
Single	5	2.2%
No Response	20	8.8%
Race		
White/Caucasian	199	87.7%
Black/ African American	2	0.9%

Asian/Pacific Islander/Hawaiian	1	0.4%
Hispanic/ Latino(a)	1	0.4%
Bi-Racial/ Multi Racial	3	1.3%
No Response	21	9.3%
Educational Attainment		
Less than HS	0	0
HS or equivalent	9	4.0%
Some College	29	12.8%
College graduate	84	37.0%
Advanced Degree	86	37.9%
No Response	19	8.4%
Annual Family Income		
<$20,000	2	.9%
$21,000-30,000	4	1.8%
$31,000-40,000	6	2.6%
$41,000-50,000	13	5.7%
$51,000-60,000	26	11.5%
$61,000-70,000	20	8.8%
$71,000-80,000	21	9.3%
$81,000-90,000	25	11.0%
>$90,000	84	37.0%
No Response	26	11.5%
Parents	198	87.2%
Non Parents	7	3.1%
State of Residence		
Georgia	152	66.9%
Other	57	25.1%
No Response	18	7.9%

Data cleaning. Data were cleaned to ensure only complete participant data sets were included in the final analysis of Pilot Study D data. The data cleaning criteria described in the previous pilot tests were utilized, which entailed the omission of any data sets with non-responses in item cells. Table 7.2 illustrates outcome of the data cleaning process which included

19 incomplete data sets (8.37%) omitted from the Childhood Obesity Locus of Control section and 45 (19.82%) removed from the Solutions section.

Table 7.2

Pilot D Data Cleaning Results of Non Responses (N = 227)

	Participants with missing data	Total number of participants	% of participants with ≥1 NA
Childhood Obesity Locus of Control	19	227	8.37%
Solutions to Childhood Obesity	45	227	19.82%

Childhood Obesity Locus of Control Data Analysis

Following data cleaning, 208 complete participant data sets in the Locus of Control section were prepared for analysis. A frequency analysis of the five Likert response options revealed adequate representation of each response option. The evidence provided each of the 21 items within this section held a range of 3 to 4 response options utilized by Pilot D participants. This identified that the number of response options were appropriate and adequately represented by the participant response data.

Permission slip tests for exploratory factor analysis. It was determined a factor analysis of these data would be an appropriate strategy based upon the *middling* KMO value of 0.752 (Kaiser, 1974) and a satisfactory *p*-value of .000 (Bartlett, 1950) (see Appendix UU). These two values indicate the sample size was acceptable (Kaiser, 1974) and the 21 items are significantly different (Bartlett, 1950) enough to constitute further analysis by means of a Principal Component Analysis. Specific explanations of these tactics have been described in greater detail in previous pilot studies (Pilot Study B and C). As a result, a factor analysis of these data was

conducted using the exploratory factor analysis technique known as Principal Components Analysis (PCA).

Correlation matrix. The first calculated data from the PCA analysis were the correlations among the Childhood Obesity Locus of Control items. The correlation values provided evidence of moderate range of correlation values (r= .406 to .698) across eight sets of items (Appendix VV). The correlation values and item pairings were similar to the findings from the previous Pilot Study C. This preliminary data provide identification of items that may have grouping tendencies in subsequent factor analyses and establish that factor analysis remains an appropriate analysis technique due to the volume of correlations noted.

Total variance explained. As the previous KMO, Bartlett test, and item correlation data suggested a PCA analysis of the 21 variables of the Childhood Obesity Locus of Control section was conducted. Appendix WW presents the total and shared variance explained within the linear combinations of the variables. The linear combinations are structured by the cohesion of aggregated variables to comprise 100% of the total variance within 21 different item/variables clusters. Based upon the guidelines of the Principal Components Analysis, data were reduced into 21 orthogonal (uncorrelated) principal components whereby the interrelationships among the original variables are represented. When allowing for twenty-one factors in this analysis in order to see how each variable contributed to the total variance, the eigenvalues and cumulative variance explained calculated were evaluated. With the components holding eigenvalues ≥1.0, five components collective represented total percent variance of 53%. To determine if the noted five components should be extracted the eigenvalues ≥1.0 and the decreasing component variances evidence pictorially in the scree plot (Cattell, 1966) (shown in Appenidx XX). Based

on this examination, the decision was made to extract four components that accounted for 48% of the total variance.

Component matrix. With the evidence provided from the PCA analysis, 48% of the total variance was explained within four extracted components. The component matrix, which served to delineate the aggregation of variables comprising the four extracted components is presented in Appendix YY with only substantial factor loadings of ≥.40 retained (Tabachnick & Fidell, 2001). The desirable simple structure was not evident in the analysis, therefore an orthogonal Varimax rotation of these data was appropriate.

Varimax rotation. The purpose of an orthogonal Varimax rotation as previously noted, is to loosen the PCA analysis restrictions on the variables held within the first component. This is accomplished by rotating the axis the data were analyzed on to emphasize linear combinations of the components (Abdi, 2001; Kaiser, 1958). This rotation often results in the maximizing and minimizing of factor loadings because of the emphasis placed on best fit of the axis to a) enhance simple structure of the component matrix, and b) capture the greatest amount of variance within the extracted components. The calculated eigenvalues, percent of variance, and cumulative percent variance obtained as a result of the Varimax rotation is retained shown in the Rotation Sum of Squared Loadings column in Table 7.3. Note that while the cumulative percent variance remained unchanged, the eigenvalues and percent of variance captured within each of the four components demonstrated some fluctuation.

Table 7.3

Total Variance Explained After Varimax Rotation, retaining five components

Comp-onent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	3.952	18.820	18.820	3.952	18.820	18.820	3.356	15.982	15.982
2	2.608	12.419	31.239	2.608	12.419	31.239	2.589	12.331	28.312
3	2.088	9.943	41.182	2.088	9.943	41.182	2.131	10.148	38.460
4	1.324	6.304	47.487	1.324	6.304	47.487	1.738	8.275	46.735
5	1.165	5.545	53.032						

The results of the rotation revealed enhanced simple structure as the variables loadings not only were amplified due to the rotation, but also the clustering of items appeared more systematic and representative of meaningful factors (Appendix ZZ). Initial examination of the rotated component matrix indicated consistencies in the behaviors of variables as was seen in Pilot Study C and consistent with the MHLC framework proposed by Wallston, Wallston, and DeVellis (1978). Based on this evidence, reliability measures of these factors were calculated.

Reliability

Following the Varimax rotation of the PCA analysis data, Benson and Clark (1982) advocate the calculation reliability coefficients among the aggregated variables proposed from the Rotated Component Matrix. Similar to previous pilot tests two reliability measures were computed, Cronbach's Alpha and Alpha if deleted. Throughout this process alpha values of .70 or greater (Nunnally, 1978) were pursued and utilized as a benchmark during item-total analysis. Table 7.4 illustrates the four components, which were named to coincide with the MHCL model

dimensions (Wallston et al., 1978), final alpha values and percent variance explained within each component; additionally the factor loading values are presented as indication of the adherence magnitude of each variable on the noted components. Descriptions of the decisions made relative to reliability calculations within each component are offered below.

Table 7.4

Pilot D Item Factors and Loadings

Component 1 ***Chance-Externality*** Cronbach's alpha = .654 (15.98% total variance)	*Factor loadings*
3. Genetics is a primary cause of obesity in children.	.514
5. It is by chance that some children are obese.	.663
6. If it is meant to be, my child will become obese.	.682
14. No one is to blame when a child is obese.	.432
18. No matter what obese children do, they will always be obese.	.442
Component 2 ***Internality*** Cronbach's alpha = .718 (12.33% total variance)	
1. If a child is obese, it is a result of his/her own behaviors.	.720
13. When a child is obese, he/she is to blame	.731
17. A child is not responsible if he/she is obese.	.445
19. I believe children have control over their obesity.	.717
20. Children are in control of their own weight.	.717
Component 3 ***Powerful Others- Outside the Home*** Cronbach's Alpha= .709 (10.14% total variance)	
10. Fast food restaurants are responsible for childhood obesity.	.840
11. The mass production of food in the U.S. is a primary cause of obesity in kids.	.805
16. Television programs targeted at children contribute to obesity in kids.	.588
Component 4 ***Powerful Others- Inside the Home*** Cronbach's alpha = .675 (8.27% total variance)	
7. A child's obesity is a result of decisions made by other people in their lives.	.701
8. Parents are responsible for the obesity of their children.	.825

Component 1- Chance-Externality. The first component after the orthogonal rotation retained eight items and accounted for 15.98% of the total variance. However, the calculated reliability of the initial eight-item factor exhibited a very weak alpha value of -.064. In recognition of this extremely low alpha value, item-by-item analyses were conducted first by means of the Alpha if deleted values and second by substantive content analysis of the item grouping.

The content analysis of this factor revealed a set of items that depicted an absence of choice or personal fault relative to obesity development. There was a collective emphasis of neutrality in the items represented. This was evident in the existence of items such as *No one is to blame when a child is obese* and *It is by chance that some children are obese.* However, several items grouped within this factor that were inconsistent with this theme. Therefore, the Alpha if deleted calculations were consulted with the intention of reducing items that were suppressing the reliability coefficient and consequently eliminating content irrelevant items.

The first item deleted from Component 1 was Item #2 *Parents should not be blamed for obesity in their children* that had been written to represent the Powerful Others- Inside the Home factor. The decision to delete this item bolstered the alpha value to .261. Next, Item #4 *I do not believe that a child's obesity is controlled by people in their lives,* was deleted to enhance the alpha value to .519. As the alpha value increased with the deletion of these particular items, the factor become increasingly representative of the Chance-Externality factor seen in the previous Pilot Study C. The final item deleted from this factor Item #15 *A child's family has a lot to do with their becoming obese* enhanced the composite factor alpha to .654. The final grouping of items was conceptually representative of the Chance-Externality factor that revealed no blame or

fault to childhood obesity development (see Table 7.4). It is valuable to note that the items in this factor were consistently represented in Pilot Study C with a previous factor loading of .675.

Component 2-Internality. The extracted factor held 12.33% of the total variance and included five variables with moderate to high factor loadings. Calculated Cronbach's alpha of the clustered items was strong (.718) and the item-total statistics further validated the grouping as a cohesive set. The item-total statistics however did indicate that Item #17, a negatively worded item, was suppressing the factor alpha value. However, in recognition of the nature and content of the item, the decision was made to retain Item #17 in sacrifice of the higher alpha value.

The final set of items in Component 2 were representative of behaviors and actions initiated from within an individual that would contribute to obesity development. For example, this can be illustrated by a child's over-consumption of high calorie foods and lack of regular physical activity, which can lead to excessive weight gain and the development of obesity. Following this logic, that obesity is a resultant of things someone does, is representative of Wallston and colleagues Internality dimension (1978). Therefore, this factor was labeled Internality, as it depicted *individual responsibility* and *behaviors* enacted by the child as contributors to childhood obesity.

Component 3-Powerful Others Outside the Home. The third component consisted of variables representative of external influencers of obesity, with particular emphasis on large-scale societal elements. The collective items appeared to explain 10.14% of the total variance and held a calculated reliability coefficient of .709. Collectively the content of the three items coincided with the Powerful Others dimension posed by Wallston, Wallston and DeVellis (1978) that entailed anything external or outside of the individual. However, as mentioned in the previous pilot study, these items presented an advanced degree of specificity in the context of

which Powerful Others influenced childhood obesity. These variables distinctly epitomized only external influencers from outside of the home, and omitted any items depicting inside the home influence. The items accounting for external influencers of childhood obesity within the home are clearly seen in the following factor.

Component 4 Powerful Others Inside the Home. Accounting for 8.27 % of the variance, the fourth component highlighted variables that described the impact of people within children's lives influencing obesity. The factor analysis encompassed three items initially within this factor, two that clearly demonstrated the influence of others on obesity and one that stated *The main thing that affects a child's obesity is what they do* (Item #12). Through an item-total analysis, the outlying Item #12 item was shown to suppress the reliability alpha to .515. If deleted, however, the alpha value would increase to .675. The consequence of deleting this item was the reduction of the number of items down to two, which according to Pett, Lackey and Sullivan (2003) was a decision that should be made with caution. When there are only two items defining a component, the challenge of deriving clear and conclusive interpretations of those data can become more difficult. Therefore, with the evaluation of the aggregated content of the other items it was evident that Item #12 did not contribute to the essence of factor, for that reason the item was removed.

The remaining two items held a coefficient of .675 and between the two of them appeared to represent external variables influencing childhood obesity. Specifically, these items expressed the concept that people involved in children's lives influenced a child's obesity. As compared to the previous factor, Powerful Others Inside the Home, best described these items making up of component number four.

Summary

Based on the interpretation of the orthogonal rotation of the PCA analysis, four factors reporting 46% of the total variance were extracted. The four factors included Factor 1 *Chance-Externality* (α=.654), Factor 2 *Individuality* (α=.718), Factor 3 *Powerful Others Outside the Home* (α=.709), and Factor 4 *Powerful Others Inside the Home* (α=.675). The first two factors, *Chance-Externality* and *Internality,* represented in this quantitative analysis demonstrated consistent item-analysis and reliability calculations across Pilot Studies C and D. These factors corresponded convincingly with the framework presented by Wallston and colleagues within the MHLC dimensions (1978). The remaining factors with sufficient reliability measures demonstrated a pronounced division of the *Powerful Others* dimension into to separate factors of *Powerful Others Outside the Home* and *Powerful Others Inside the Home.* These factors displayed persistence again across pilot tests; however, the stability of variable within the items as well as the evidence of ≤3 items per factor was not particularly impressive.

Overall, the four prominent factors extracted from the locus of control items provide an exemplary stride in operationalizing the latent construct of childhood obesity locus of control. While further investigation of several factors will enhance the stability and potential reliability values, yet the internal reliability and stability of the *Chance-Externality* and *Internality* factors will be used in subsequent analysis to investigate interrelationships between childhood obesity locus of control beliefs and perceived support of obesity prevention strategies. *Data Analysis Solutions to Childhood Obesity*

Forty-five participant data sets (19.8%) were omitted due to the existence of incomplete or non-response items, as a result 174 complete participant data sets remained for subsequent analysis. The response format of this section was rank order, which required data to be coded in

accordance with participant ranked (i.e., 1= first choice, 2= second choice, etc) and then transposed into an electronic Excel document for analysis. Analysis of these data included descriptive statistics as displayed as mean, mode, and range. The computed statistics from Pilot Study D are reported below in sequence of the five CDC focus area groupings along with indications of trends within participant responses (see Appendix AAA). Trends relative to participant rank-order will be presented.

Education and community-based programs. Among the obesity prevention strategies encompassing the Education and community-based programs focus area, the strategies explicitly contained elements of education, awareness, and/or engagement of obesity prevention-related content. Participants responded to these items with greatest support going towards strategies within the Institutional SE Model level. Participants favored the Institutional selection option in Item #1 *Enhance PE classes with information about the outcomes associated with obesity* (M=1.46, SD = 0.68) and Item #2 *Increase physical activity opportunities for children within the structure of the regular school day* (M=1.19, SD = 0.48). Evident by participant responses, the endorsement of school related strategies within the Institutional SE level was most prominent. This was seen also in participant rank ordered second choice selections. This finding is consistent with previous studies that indicated parents perceive that schools should take a "major role in promoting the health of children" (Sahota et al., 2001, p. 2). From the current study findings, it appears that parents also perceive the role of school to be a primary one in the prevention of childhood obesity.

Environmental health. The CDC positioned the broad goal of promoting health for all "through a healthy environment" (2000, p. 8-3) within the Environmental health focus area. The elements that surround this focus area entailed a various components that direct one's health such

as "chemical, physical and biological agents, as well as… physical and social environment, which includes housing, urban development, land-use and transportation, industry and agriculture" (p. 8-3). In alignment with this sentiment, the prevention strategies denoting Environmental health were reflective of elements the physical environment such as air quality, land use, and clean drinking water.

The findings indicate that participants consistently ranked solutions that were associated with enhancing public park facilities and resources as their first choice items. With mean values positively skewed and small standard deviation values Item #3 *Provide more supervised parks and recreation programs for children* (M=1.37, SD = 0.72) and Item #4 *Public programs and funds to improve walking and biking trails* (M=1.66, SD = 0.75) were deemed most favored. Although the SE Model levels were different between these two strategies, Community in the former and Social in the latter, the consistency of participant responses favoring the strategies that denoted improvement to the built environments was prominent. Sallis and Glanz identified built environments as "consist[ing] of the neighborhoods, roads, buildings, food sources, and recreational facilities in which people live, work, are educated eat and play" (2006, p.90). Scholars have recently initiated greater support and investigation of the relationship between built environment and physical activity behavioral patterns (Handy, Goarnet, Ewing, & Killingsworth, 2002; Reed, Wilson, Ainsworth, Bowles & Mixon, 2006).

Prevention strategies illustrative of environmental health components such as improving air quality (Item #3 Social and Item #4 Interpersonal) and ensuring safe drinking water (Item #3 Interpersonal) were negatively skewed by evidence of mean rankings ranging from 2.70 to 3.43. The interpretation of these values is that such strategies are less familiar to parents and appear to be far removed from the common discourse of what causes obesity in children. Acknowledging

this may provide a fertile line of inquiry investigating the impact and perception of these less obvious contributors of childhood obesity.

Access to quality health services. The rank-order responses of obesity prevention strategies within the CDC focus area of Access to quality health services indicated greatest participant support of Social level initiatives. Within Items #5 and #6 the mean and mode values representing participant responses, established evidence of this finding. Specifically, Item #5 *Reduce insurance premiums for healthy families* (M=1.85, SD = 0.92) and Item #6 *Financial incentive for families choosing prevention-based medical options* (M=2.07, SD = 1.32) tended to include elements of financial reward or enticement for families. The average responses within both of these items represent negatively skewed means indicating enhanced support (i.e., 1= first choice, 4= last choice). This pattern of support across the sample presents distinctive changes at the Social level, particularly within the health care system and public/private health insurers to necessitate the launch of such proposed strategies (Committee on Preventing Obesity in Children and Youth, Koplan, Liverman, & Krack, 2004).

The obesity prevention strategies within the CDC focus area of Access to quality health services that were identified as receiving least support by the sample involved any type of surveillance or tracking of childhood obesity or health data. Strategies with mode values of 4 (least support) were Item #5 *Computerized obesity tracking program managed by school nurses* and Item #6 *Community-wide obesity risk assessment and screening*. This finding is intriguing as many epidemiologic studies (Berkey et al., 2000; Epstein, Paluch, Gordy & Dorn, 2000) have derived valuable obesity prevalence and risk factor data from longitudinal surveillance and health tracking initiatives. The fact that Pilot Study D and C participants noted these strategies as

least supported could have negative implications for future long-term investigations of obesity development and/or prevention.

Nutrition and overweight. Obesity prevention strategies encompassed within the CDC focus area of Nutrition and Overweight specifically address nutrition-related and food option aspects. These data provided signs of support largely reflective in the Interpersonal and Institutional SE Model levels. Within Item #7 alone two selection options had mode values of 1 (highest support) yet relatively distinct means, standard deviation values, and SE levels, they included: *Modification to school meals—reducing sodium, sugar, and fat content* (*M*=1.51, *SD*= 0.74) and *Parental encouragement of fruit intake* (*M*=2.19, *SD*= 1.02). The selection choice within Item #8 that received greatest support was *Prohibit junk food or sugary sweets to be brought into school classrooms* (*M*=2.07, *SD*= 1.00). In accordant to previous interpretations regarding the school's role of promoting health in children, the parental responses to Nutrition-related strategies reinforce this notion as school related nutritional modifications and guidelines were primary strategies noted by Pilot Study D participants.

Nutrition-based strategies ranked least favorably by participants were persistent within the Social level. Item #7 *Enhanced legislative funding of obesity-related nutrition programs and research* (*M*=3.18, *SD*= 0.94) and Item #8 *Increase tax on high fat foods* (*M*=3.50, *SD*= 0.81) were identified with the lowest ranked items across the sample. These findings were coherent with data from a recent poll of U.S. adults whereby obesity solutions receiving least support were at the Community and Social levels involving governmental zoning regulations of fast food restaurants and government related regulations of food advertising to children (Cummings & Health Interactive, 2006).

Physical activity and exercise. The final CDC focus area comprised Physical activity and exercise related strategies. Respondents indicated greatest support of items within the Interpersonal SE category via mode values denoting greatest frequency of rankings of one. The first choice within Item #9 stated *Increase the number of parents engaging in physical activities with children* (*M*=1.70, *SD*= 0.91) and in Item #10 *Parental restrictions on child's television viewing time* (*M=2.11*, *SD*= 1.13). A substantial body of literature has identified parent and family involvement in obesity prevention to be positive in the areas of time spent watching television (Dietz & Gortmaker, 2001) and increasing physical activity behaviors (Epstein, Paluch, Gordy, & Dorn, 2000; Golan, Weizman, Apter, & Fainaru, 1998). Therefore, this acknowledgment by *parent* participants that *parent* involvement physical activity and exercise prevention strategies are most supported is encouraging.

Summary

The data captured from the Solutions to Childhood Obesity section provide insight to the type and social context of obesity prevention programs that parents would support in their communities. Because the response format in this section required participants to delineate the strategies in order of preference and support, the outcome data was suitable for identifying trends support and opposition of particular strategies. Further, the systematic categorization employed by the researcher allowed for associations among prevention content and social context to be specified. As a result, five primary trends emerged from the quantitative rank-order data.

First, sample participants consistently supported strategies that involved changes or modifications to be made at the school level relevant to educational and nutrition-based interventions. Second, improvements to the built environment were favored by participants over any other Environmental health related strategies. Third, participants responded in stark

opposition to any obesity prevention strategies that suggested health surveillance or obesity tracking in both Quality health services and Environmental health focus areas. Fourth, social level initiatives depicting governmental regulations or enforcement in nutrition-related strategies were again strongly opposed by parent participants. Finally, the fifth trend that emerged from these data was that parents identified greatest support of Physical activity and exercise strategies at the Interpersonal level, which in turn emphasized and acknowledged their own role in obesity prevention.

Evaluation of Locus of Control and Supported Solutions Interaction

The purpose of this study was to develop a survey instrument that measured parent perceptions of a) childhood obesity locus of control and b) solutions to childhood obesity. Based on the conclusions made from Pilot Study D there appears to be a logical connection between the factors parents believe influence childhood obesity and the strategies they perceive as fitting to help solve obesity. Further, based on the notion of social learning theory that posits behavior is a joint function of expectancy and reinforcement of values (Rotter, 1954) the potential interaction between the two measured constructs was investigated.

Method

To initiate this examination, two primary data components were necessary, these included a) participant childhood obesity locus of control factor scores and b) participant first-choice prevention strategy selections. First, participant factor scores were calculated in SPSS (v. 16.0) to reflect participant response to the newly established childhood obesity locus of control Internality factor. The decision to use the Internality factor was based upon the evidenced of item stability and factor reliability measures across Pilot Studies C and D.

The factor scores were then calculated based upon participant responses to the items espoused within the Internality factor. Each participant was assigned an Internality score, which was an indicator of how strongly the participant perceived Internality to be as a contributor to childhood obesity. If the participant had strongly endorsed Internality, then their factor score would be high, if not it would be low. For the purposes of this analysis, the participants with moderate Internality scores were omitted.

Next, the respondent data were matched with their ranked Strategies data. Only full data sets were utilized, thus resulting in 111 matched sets. There was a nearly equal distribution of Low Internality and High Internality scores (*n*= 59 Low I, *n*= 52 High I). Following this, frequencies of prevention strategies with a rank of one across Low and High Internality score groupings were calculated. The results are organized and displayed as percentages of the frequencies across Low and High Internality participant groups (see Appendix BBB). Discussion of evidence relative to the proposed interaction is presented below organized within the CDC focus area groupings.

Education and community-based programs. The primary discrepancy between participants with low and high Internality scores within this focus area is the considerable difference between High Internality participants choosing the Institutional Item #1 *Enhance PE classes with information about the outcomes associated with obesity*. The majority of High Internality participants (78.8%) indicated this first choice whereas less than half (46.6%) of the Low Internality participants did. Also interesting, was the 40% of Low Internality participants selecting the Social level strategy of Item #1 *Government sponsored incentives for schools to enhance healthy environments*; which was ranked one by only 13 percent of High Internality participants.

The data from Item #2 indicated that over 80 percent of the total sample selected the Institutional selection choice as their top ranked strategy. It is significant to note that no participant ranked this strategy as a four (least support). While there is not evidence of a distinct interaction by factor score, the overwhelming assertion that this childhood obesity prevention strategy is by far the most supported would be beneficial to know if planning or designing an obesity intervention program.

Environmental health. No significant differences were evident in the proposed Environmental health content-based prevention strategies across factor groupings to suggest interaction. However, similar to above the Community option within Item #3 *Provide more supervised parks and recreation programs for children* was ranked as the strategy to received greatest support by the majority of the sample (76% Low, 78% High).

Access to quality health services. Amid the strategies proposed within the Access to quality health services groupings, there was an evident first-choice distinction across the factor groups. Sixty-five percent of participants with High Internality scores consistently ranked the Social level strategy within Items #5 as their first choice; where as only 38 percent Low score participants assented. Rather, the Low score participants showed preference (51%) to the Community level item that stated *Offer inexpensive community-wide programs promoting obesity prevention*.

Nutrition and overweight. The frequency response patterns within the Nutrition and overweight prevention strategies exhibited a particularly interesting finding in Item #7. The data suggested that the majority (70%) of Low score participants identified the Instructional level strategy of *Modifications to school meals—reducing sodium, sugar and fat content* ranked as a one, whereas less than half (48%) High score participants deemed this their first choice. Rather

High score participants were split between the above-mentioned item and the Interpersonal level *Parental encouragement of fruit intake* (40%).

Frequency responses to Nutrition and overweight within Item #8 revealed a wide and consistent distribution of strategy favorites across Low and High score participants. Due to the dispersed first choice ranking of particular interest were the low percentages (range, 1.9%-6.6%) for Social level strategy involving *Increase tax on high fat foods.* This strategy was ranked as fourth/last choice to support by over two thirds of the sample (70% Low, 73% High).

Physical activity and exercise. Amongst the Physical activity and exercise solutions the data revealed that within Item #10 almost half Low score participants favored the Social item *Increase the number of public parks and recreation areas* but included only one quarter of High score participants. The item that was favored by almost half of the High score participants was the Interpersonal item *Parental restrictions on child's television viewing time*, of which only 38 percent of Low score participants agreed. This distinction between Social and Interpersonal type strategies and the apparent difference in factor score respondents could be interpreted that Low score participants who do not believe childhood obesity to be controlled by the child's behaviors would support the intervention that is as such furthest from the individual, hence the Social level program. On the contrary, High score participants who subscribe to obesity being highly influenced/controlled by the child's behaviors noted support of intervention strategies closest to the individual, the Interpersonal level. This pattern may or may not persist across subsequent samples, but it did so here in Item #10 and was partially evident in Item #9.

Summary

The purpose of these calculations was to explore the potential interaction between participant's perception of Internality childhood obesity locus of control beliefs and supported

solutions to childhood obesity. Preliminary frequency analysis indicated the greatest variation between participant strategy selections and Internality scores within the two CDC focus areas of a) Physical activity and exercise and b) Nutrition and overweight. The data revealed that patterns of Low Internality participants consistently ranked Social and Community level strategies as their first choice strategies. These strategies were noted to be more indirect at combating childhood obesity, as they were positioned within the two SE Model levels furthest away from the individual. While there appeared to be only slight to moderate evidence of interaction between locus of control beliefs and first choice obesity prevention strategies, if a relationship could be identified the implications for interventionists, public health officials, administrators, and even physical educators would be substantial. It may be possible that the childhood obesity locus of control *Chance* factor may produce discrete conclusions on the presence of an interaction.

Summary of Phase IV: Validation

The purpose of this study was to develop a survey instrument that would measure parent perceptions of a) childhood obesity locus of control and b) prevention strategies to childhood obesity. To accomplish this, the final phase proposed by Benson and Clark (1982) was critical in evaluating instrument's ability to reach the primary objectives of the stated instrument. The Validation Phase served to establish preliminary evidence of validity and internal reliability of the newly developed instrument. Participants were recruited to complete a paper/pencil or electronic based survey (N=227). Findings within the Childhood Obesity Locus of Control section resulted in four representative factors of this construct that held 46% of the total variance. Two primary factors that demonstrated stability and inter-item reliability were Chance-Externality (α =.654) and Internality (α .718), each of which had five items and collectively

estimated 25 percent of the total variance. The extraction of these two factors accentuated the need for additional investigation of the dissected Powerful Others- Inside the Home and Outside the Home factors, to better understand the intricate perceived differences between the factors and to enhance the number of items within each factor.

Within the Solutions to Childhood Obesity section, findings demonstrated five response trends across the dually categorized strategies. First, sample participants consistently supported strategies that involved changes or modifications to be made at the school level relevant to educational and nutrition-based interventions. Second, improvements to the built environment were favored by participants over any other Environmental health related strategies. Third, participants responded in stark opposition to any obesity prevention strategies that suggested health surveillance or obesity tracking in both Quality health services and Environmental health focus areas. Fourth, social level initiatives depicting governmental regulations or enforcement in nutrition-related strategies were again strongly opposed by parent participants. Lastly, parents reported greatest support for Physical activity and exercise strategies at the Interpersonal level, which in turn emphasized and acknowledged their own role in obesity prevention.

The final analysis of the collected data from this newly developed instrument sought to highlight patterns of interaction between participant Internality childhood obesity locus of control beliefs and the selection of first choice prevention strategies. Preliminary data suggested slight to moderate evidence of interactions between the two components. Further investigation is required.

With the final phase of the instrument development model proposed by Benson and Clark (1982) there are a variety of conclusions and implications that will be discussed relative to the newly developed instrument. As stated in the model, this process is reiterative and while the

desired outcome of an instrument is to have a tight knit set of items that are perfectly reliability and measure the objectives flawlessly, continued testing, analyzing, and modifying the instrument will serve to establish a valid and reliable instrument.

CHAPTER 8

DISCUSSION

The purpose of the study was to develop a survey instrument to measure parent perceptions of (a) childhood obesity locus of control and (b) potential solutions to childhood obesity. A four-phase reiterative instrument development model proposed by Benson and Clark (1982) was used to establish preliminary evidence of instrument validity and reliability. This chapter will provide a commentary of the findings and implications of the final 31-item instrument. To begin, the four factors proposed to measure childhood obesity locus of control will be presented and evaluated based upon their applicability to current scholarship. Second, the trends evident in the proposed solutions to childhood obesity offered by the participants will be discussed. The third element described will be the implications of the observed interactions between parental locus of control beliefs and perceived solutions to childhood obesity. A discussion of the instrument's ability of meeting the stated objectives and potential limitations of the instrument will then be offered. The chapter will conclude with a presentation of recommendations for future research.

Childhood Obesity Locus of Control

As a result of four successive pilot tests, Principal Components Analysis factor analysis revealed four factors contributing to the measurement of childhood obesity locus of control. Participants (N =622) completed working versions of the instrument including 5-point Likert response items (range 1 strongly disagree, 5 strongly agree) depicting variables associated with childhood obesity development. The findings presented the following four factors Internality, Chance-Externality, Powerful Others Outside the Home, and Powerful Others Inside the Home captured 46percent of total variance.

Internality

One of the most stable factors shown to equate with childhood obesity locus of control was Internality. Adapted from the MHLC dimension of Internality (Wallston et al., 1978), this factor embodied the internal abilities and capabilities of an individual to control his/her health, specifically his/her obesity. Conceptually, this factor represented variables within the control of the child, without specifying exact behaviors. Terminology was used that explicitly placed responsibility of obesity development or prevention on the individual. Participant response to this factor, as evidenced by statistical means (range, 2.76-3.56), indicated a relatively neutral position with noted variability within each item. Identified in Table 8.1 are the five Internality items accompanied with response mean and standard deviation values. The two items that include the word *control* and position that control in the hands of the child have decidedly the greatest mean values of the group, whereas the item with the word *blame* is the lowest. Interpretation of this observation may highlight the negative connotation of the particular terms, such as blame, when associated with obesity.

The relatively neutral stance on the newly defined factor of Internality appears low in relation to previous findings. Empirical based evidence has suggested that internal behaviors such as physical inactivity (Ischander et al.,2007; Must & Tybor, 2005), poor nutritional habits (Berkey et al., 2000; Warner, Harley, Bradman, Vargas, & Eskenazi, 2006), and excessive use of modern technology are highly associated to childhood obesity. While the newly defined Internality factor did not specify distinct behaviors within each item, other scholars using various methodological approaches have investigated adult's perception of specific child-centered obesity related behaviors. Findings have emphasized children's nutritional patterns and eating habits (Hesketh et al., 2005) such as excessive consumption of junk food and sodas (Evans et al.,

2005) and personal attributes of children such as lack of willpower (Oliver & Lee, 2005). These findings reinforce the adult perception of child-based, internal variables contributing to childhood obesity.

Hardus, van Vuuren, Crawford and Worsley (2003) and Covic, Roufeil, and Dziurawiec (2007) establish further evidence of support for the Internality factor in their work measuring Australian adult perceptions of childhood obesity. Hardus and colleagues found that over consumption of food and modern technology and media use were perceived to be two primary factors causing childhood obesity (2003). Another sample of Australian adults agreed as variables associated with emotional eating, eating habits and contemporary lifestyle (i.e., *Too much time playing computer games*) were noted as leading causal factors (Covic et al., 2007). These two studies utilized survey methodology to capture these perspectives. The instruments used encapsulated detailed and circumstantial variables within most factors. For instance, items within the Over consumption of food factor stated *Eating too many high fat foods at home* and another *Children have too much money to spend on unhealthy food* (Hardus et al., 2003). The specificity of variables within the noted instruments and the factors reinforced by participants further substantiate the existence of the newly established Internality factor.

Suggesting that the Internality factor could serve as a reliable measure of childhood obesity locus of control was evidenced by the high reliability coefficient (.718) and item consistency across pilot studies. An identified constraint of this factor was the lack of definition of the child's age. Participants noted the challenge of deciphering at what age a child should be *responsible if he/she is obese.* It is recommended, therefore on subsequent versions of the instrument to denote an age range of prospective children (e.g., Children under 12 years old). Another identified challenge pointed out by participants with the generalities of the Internality

statements. Within debriefing comments, participants would allude to specific behaviors (similar to the Hardus et al., 2003 items) and suggest greater specificity within the statements. These suggestions were heeded with caution in an effort to maintain singularity and conciseness of the items, that is, to not double load an item with an internal behavior that is influenced by an external factor (i.e., family income or race). It is acknowledged that this may serve as a limitation to the items within this factor. Overall, the variables encapsulated within the Internality childhood obesity locus of control factor satisfactorily met the objective of instrument.

Table 8.1

Internality Factor (α= .718)

	M	*SD*
If a child is obese, it is a result of his/her own behaviors.	2.76	*1.12*
When a child is obese, he/she is to blame	2.43	*1.09*
A child is not responsible if he/she is obese.	3.18	*1.05*
I believe children have control over their obesity.	3.52	*0.99*
Children are in control of their own weight.	3.56	*0.98*

Chance-Externality

Another stable factor measuring childhood obesity locus of control was Chance-Externality. The variables within this factor encompassed a no fault aspect to childhood obesity development and conceptualized the instance of luck and relative happenstance. In association with the Chance dimension noted by Wallston and colleagues (1978) whose example of a chance item was *My good health is largely a matter of my good fortune*, the phrasing and word choice in

this study also sought to emphasize fortune and luck. One participant responded to this notion of luck by stating: “Luck equals what? Luck in your parents? Lucky cultural background?” This participant statement truly epitomizes the lack of discourse revolving around the concept of luck or chance as a cause of childhood obesity. The concepts of fate and luck are rarely associated with childhood obesity and relatively non-existent (unexplored) terms or keywords used in obesity literature.

Interestingly however, across the pilot studies the variables written to represent the Chance factor were reasonably consistent in their grouping together, that is, all but one. The item depicting genetics as a causal factor of childhood obesity was unstable across pilot tests. For example, within Pilot Study C the genetics item was found to be independent factor of the Chance items and grouped with unrelated items. This appeared to be consistent with findings from Hardus et al (2003) wherein their *genes* item paired with *There is an overemphasis on academic work* item in an unnamed factor. However, in Pilot Study D of the current study, the genetics item assimilated with the Chance variables. This instability of the item was intriguing and based upon current investigations of genetic disposition and obesity an exploration of how it could have affected participant responses was undertaken.

Genetics. A potential explanation of the instability of the genetics item across pilot tests could have been attributed to the multiple definitions of the terms *chance* and *genetics*. The term *chance* can be interpreted as an unpredictable occurrence in which no cause is understood; or *chance* can be perceived as the likelihood or probability of an occurrence. For the purpose of this instrument, the term was intended to prompt the former interpretation. Next, because word chance can be interpreted differently, the concept of genetics could be associated as either a synonym or an antonym. For instance, if the genetics were to be perceived as synonymous to

chance, the respondent may subscribe to the notion that a child is unable to control or predict his/her genetic profile; therefore genetics is a variable of chance. If, however, the respondent interpreted chance as a predictable occurrence, then a child's obesity would be based upon the composite of obese parent genes and therefore an independent factor. From both perspectives, there are reasonable explanations for the interpretations. This suggests the necessity of further exploration of parent perceptions of genetics as a variable of childhood obesity.

As genetic research techniques become more advanced, the proliferation of genetic make-up serves as a common explanation of a risk factor for disorders, conditions and behavioral traits. Scholars purport that while alcoholism is a complex disorder with both genetic and environmental risk factors, research presents evidence and the investigation of specific genes as potential links to alcoholism (Edenberg & Foroud, 2006). Similarly, the search continues for the obesity gene. Some scholars are encouraged with findings that suggest 40 to 70 percent of obesity-related phenotype could be inherent (Comuzzie & Allison, 1998) and therefore, investigation continues of specific mutated genes that affect body weight and adiposity (Rankien, Zuberi, Chagnon, Weisnagel, Argyropoulos, Walts, Pérusse, & Bouchard, 2006). Because of the increased investigation of genetic predisposition of obesity, there has been a subsequent increase in the dissemination of such findings into pubic media sources. To what end parents perceive genetics to be a primary contributor to childhood obesity however requires further qualitative examination. Broadening this understanding could assist in identifying not only the impact of the development, but could expose how parents intend to respond to the potential genetic predisposition of obesity.

Overall, the Chance-Externality factor appeared to have substantial influence on the measurement of childhood obesity locus of control. With moderate reliability of .654 and similar

item groupings that accounted for 16 percent of the total variance, this factor was the second most stable of the analysis. The notion of no fault and no blame of childhood obesity was not favorably subscribed to, as evidenced in the low response mean values (range, 1.66-2.75). However, the instability of the genetic-related item stimulated additional curiosity regarding the perceptions of genes as a casual factor of obesity. It is recommended that further investigation of this variable be conducted to provide a greater understanding of how genetics is perceived to influence obesity and if such beliefs are associated with particular health-related behaviors.

Table 8.2

Chance –Externality Factor (α = .654)

	M	*SD*
Genetics is a primary cause of obesity in children.	2.75	*1.07*
It is by chance that some children are obese.	2.51	*1.18*
If it is meant to be, my child will become obese.	1.80	*0.88*
No one is to blame when a child is obese.	2.07	*0.96*
No matter what obese children do, they will always be obese.	1.66	*0.76*

Powerful Others

Obesity-related research strongly suggests that others in the lives of children, such as parents, educators, peers, and family members as significant influencers to obesity development and prevention in children (Andersen & Wold, 1992; Kimiecike & Horn, 1998; Hoeffer, McKenzie, Sallis, Marshall, & Conway, 2001). Literature often addresses the dimension of powerful others through investigating how peers physical activity patterns impact the physical

activity patterns of children (Anderssen & Wold, 1992) or parental feeding habits influence children's eating habits and weight status (Birch & Davison, 2001; Birch & O Fisher, 2000; Klegseges, Malott, Boschee, & Weber, 1986). Further, the built environment, such as roads, buildings and food sources as well as perceived community safety (Evans, Finkelstein, Kamerown, & Ranaud, 2005) have also been noted in physical activity literature as determinants of children's obesity and weight status. These scientific based findings were again reported in the initial stages of instrument development. Pre-pilot study participants (N=17) consistently identified parents as directly influencing the development of children's obesity, while also acknowledging societal influences such as conveniences of fast food restaurants and insufficient educational promotion of physical activity and nutrition. The unequivocal parallel between unsolicited parent participant responses to the cause of obesity and the empirical evidence provides a strong case that there are both direct and indirect external powers that impact the lives and behaviors of children.

The factor analysis of the survey instrument revealed that collectively the items originally written to represent the Powerful Others dimension accounted for nearly 19 percent of the total variance of childhood obesity locus of control. Nevertheless, the original items did not group together as a unified factor, rather into two distinct factors. The findings clearly identified a) Powerful Others Inside the Home and b) Powerful Others Outside the Home. While this was unexpected, the discreteness of the two factors exemplified a greater specificity to the Powerful Others dimension that had previously not been accounted for by Wallston et al., (1987). Further explanation and discussion of the implications of these discrete factors are presented below.

Powerful Others Outside the Home

The factor representing variables of influence outside of the home held three items that consistently grouped together with a reliability coefficient of .709 (Table 8.3). Accounting for 10 percent of the variance, the items depicted large-scale social mechanisms including fast food restaurants, mass production of food, and television programs as elements of influence. These variables are illustrative of external elements that the individual does not control. These particular examples magnify modern conveniences and contemporary lifestyle afforded to children and adults. Persistence of this factor across pilot tests appears congruent with previous obesity perception literature. Hardus and colleagues (2003) identified Australian parents strongly endorsed over consumption of fast foods and media promotion of unhealthy foods. American parents also have acknowledged outside of the home variables influencing obesity in children. Evans et al (2005) reported parents stated the lack of exercise during the school day and deficient number of places to exercise as primary contributors to childhood obesity.

A noted limitation to this factor is the small number of variables represented. Although the reliability coefficient was strong, the addition of several items embodying this factor could further strengthen and broaden the scope of this factor. Of particular interest would be in the inclusion of items depicting the role of school and the built environment on childhood obesity. These variables are noted due to the substantial literature that suggests parents perceive the role of school to be imperative to addressing childhood obesity (Murman et al., 2006; Murphy & Polivka, 2007; Sahota et al., 2001). Also, the application of items representing the built environment (Sallis & Glanz, 2006), social policy and regulations (Oliver & Lee, 2005), and financial constraints (i.e., cost of healthy foods) (Glanz, Basil, Maibach, Goldberg, & Synder,

1998) as viable contributions to further understanding what external components parents perceive to be most significant to childhood obesity locus of control.

The distribution of participant responses to the items embedded within Powerful Others Outside the Home was relatively high (range, 3.05-3.39). Seeing this implies that variables beyond the control of the child, and in this case the parent as well, are perceived to strongly influence childhood obesity development. It is noted that this sample of respondents were predominately Caucasian females who are tertiary educated, therefore acknowledged that this observation may vary across a different demographic. For this reason, it is encouraged that supplemental items relative to Outside the Home be built into this factor in order to be more representative of the experiences encountered by the respondents.

Table 8.3

Powerful Others Outside of the Home Factor (α = .709)

	M	*SD*
Fast food restaurants are responsible for childhood obesity.	3.05	1.18
The mass production of food in the U.S. is a primary cause of obesity in kids.	3.07	1.17
Television programs targeted at children contribute to obesity in kids.	3.39	1.03

Powerful Others Inside the Home

The factor characterizing the impact that people within a child's life, particularly within the home measured 9 percent of the total variance of the childhood obesity locus of control. However, only two items held together with a reliability value of .675. Table 8.4 identifies the items that represented the factor Powerful Others Inside the Home. Scholars have consistently

identified relationships between obesity development and parental feeding habits (Birch & Davison, 2001; Birch & O Fisher, 2000), parent obesity (Maffeis, Talamini, & Tatò, 1998) and home environments (Strauss & Knight, 1999). These studies further substantiate the utilization of the MHLC dimensions as a model for instrument development- because there is such an abundance of evidence of Powerful Others (Wallston et al., 1978). Additionally, as resultants of these studies intervention programs have been developed to include parent and family members in obesity prevention and intervention programs with relative success (Etelson, Brand, Patrick, & Shirali, 2003; Golan & Crow, 2004; Pate, Trost, Mullis, Sallis, Wechsler, & Brown, 2000; Wofford, 2008).

While such evidence has indicated that people closely associated with children, have significant potential to impact children's health and weight status, consequently few studies have measured perceptions of this notion. Birch and colleagues (2001) developed an instrument to measure parent attitudes and behaviors related to child feeding practices and the impact on obesity development. Another measure, again positioned by Hardus and colleagues delivered the heavy punch with a factor named Parental Responsibility (23% total variance) that encompassed items such as *Parents aren't aware of the dangers of obesity* and *Parents don't know how to promote physical activity* as measures of causes of obesity among primary school children (Hardus et al., 2003). Covic as well presented elements of Powerful Others Inside the Home within their developed instrument. However, rather than all of the items relative to Powerful Other Inside being clustered into one factor (as seen on the current instrument and on Hardus et al), the *Childhood Obesity Questionnaire* highlighted external influence variables across multiple factors. For instance, there was evidence of Inside the Home variables within the Eating habits and food knowledge factor (9.6% variance) defined as *Family eating habits* and *Poor parental*

supervision of diet. Also within the Cost of contemporary lifestyle factor (6.8% variance) where items such as *Number of siblings in family* and *Working parents do not have time to prepare healthy meals* emphasized the family as contributing variables (Covic et al., 2007). These primary instruments have encapsulated the notion of Powerful Others Inside the Home, but what remains to be explored is how individuals (parents) perceive their role in childhood obesity development.

The response data from this factor indicate that parent participants acknowledge their role in obesity development in children. This is evidenced by the high mean values on the factor of Powerful Others Inside the Home (range, 3.84-3.94). While there were only two items held within this factor, the evidence of strong agreement supports further exploration. The instruments identified above may be consulted in the types of items that may be used to supplement and enhance the comprehensiveness of this factor.

Table 8.4

Powerful Others Inside of the Home Factor (α = .675)

	M	*SD*
A child's obesity is a result of decisions made by other people in their lives.	3.84	0.79
Parents are responsible for the obesity of their children.	3.94	0.69

Summary

Inspired by the framework of Multidimensional Health Locus of Control (Wallston et al., 1978) the childhood obesity locus of control construct produced four factors accounting of 46 percent of the variance. Two factors exhibited stable characteristics throughout the pilot testing and established solid number of items within each factor, these included Internality and Chance-

Externality. Collectively, these relatively dichotomous factors consistently captured nearly 30 percent of the variance within the sample. Further, both factors demonstrated moderate to strong reliability coefficients and item-analysis calculations across pilot tests. The extraction of two stable factors from such an exploratory effort to measure parental perceptions of childhood obesity locus of control is very encouraging.

The remaining factors that emerged from the factor analysis, Powerful Others Inside and Powerful Others Outside of the Home, attributed for nearly 19 percent of the explained variance but did not exhibit such stability across pilot tests. When compared to the original MHLC dimension of Powerful Others, this study produced two factors highly representative specificity in the type and context of *others.* This finding elicits great potential in subsequent analyses and measurement of childhood obesity locus of control, as related to the external influence. Additional exploration of these two seemingly independent factors be conducted due to the current small number of items representing each factor is recommended. Previous childhood obesity literature accentuates the presence of both factors as contributing to childhood obesity development and hence further verifies the need for ensuing study. The evidence of this enhanced specificity illuminates the distinction parents perceive to be evident among powerful others influence on childhood obesity.

Overall, the consistent extraction of these noted factors within the initial attempt of defining childhood obesity locus of control and to have them capture 46 percent of the total variance is as stated earlier, encouraging. The variance explained within this instrument is consistent with previous measures attempting to capture similar construct (Covic et al., 2007; Hardus et al., 2003). The implications of the ability to measure perceptions of childhood obesity locus of control can serve as a useful assessment of stakeholders held beliefs and values of the

causal factors associated with obesity development. This information may be used to assist understanding what parents believe to cause childhood obesity and in turn, assist in the design of educational programming, and assess the need for parent directed awareness campaigns regarding obesity prevention.

Perceived Solutions to Childhood Obesity

Guided by the objective to measure parent perceptions of solutions to childhood obesity forty dual categorized prevention strategies were founded within five *Healthy People* 2010 focus areas and four Social Ecological levels (Brofenbrenner, 1979; McElroy et al., 1998). Participants ranked sets of four potential obesity solutions that were embedded within the above-mentioned categories. To the author's knowledge, this was the first instrument to present solutions to obesity in this manner. This section will identify the three predominant trends that emerged from the data.

Endorsement of Built Environment Enhancements

The first theme identified in the data was the emphasized participant support for improvements to the built environment. Sallis and Glanz (2006) defined built environments as "consist[ing] of the neighborhoods, roads, buildings, food sources, and recreational facilities in which people live, work, are educated eat and play" (p.90). Some of these elements can easily be overlooked as contributors to obesity. For example, current discourse has addressed issues of land use and the particular overabundance of zoning for commercial development. A consequence of this is minimal attention paid to opportunities for pedestrian usage or transportation by walking or bicycling (Jackson, Kochtitzky, 2001; Saelens, Sallis, Frank, 2005). Transportation patterns in many communities across the country require automobiles, and often have poor links between residential areas and both local commerce and educational facilities

(Handy et al., 2002). Transportation by automobile has related consequences to air quality and the necessity of more roads and travel infrastructure; thus reduces land available for recreation. Extensive research in this area has prompted national and international attention to the affects of the built environment on either facilitating or hindering behaviors most often associated with obesity: physical activity and obesity (Booth, Pinkston, & Poston, 2005).

For these reasons, solutions to childhood obesity presented in the instrument focused on elements of both the built environment as well as the physical environment (i.e., air and water quality). The two focus areas which best embodied these elements were the Environmental health and Physical activity and exercise. As such, the rank order data revealed a dominant trend of support for enhancements and improvements to local parks and recreation areas. Participants strongly favored strategies including *Provide more supervised parks and recreation programs for children* and *Public programs and funds to improve walking and biking trails* within the Environmental health area. Moreover, within the Physical activity and exercise a highly supported solution was *Increase the number of public parks and recreation areas*. The high frequency of support of recreation and land use improvements, may be attributed to the middle class social status of the sample population.

Previous literature has indicated that the perspectives of high, middle, and low SES groups related to environmental impact and physical activity differ. Burton, Turrell, and Oldenburg (2003) investigated how psychological, social and environmental components influenced the recreational physical activities of adults. Findings suggested that high SES adults noted participation in recreational activities for the "social benefits" (p. 230) and "living a balanced life" (p. 230). Whereas low SES adults suggested psychological health was a primary influence on their physical activity behaviors—having lost a companion or chronic health

conditions (Burton et al., 2003). While these findings, and others related findings (Brennan, Baker, Haire-Joshu & Brownson, 2003; Stempel, 2005) are relative to adult physical activity participation, they may provide insight to a potential varied perspective of recreational land-use as a priority for solving childhood obesity.

Opposition of Obesity Surveillance and Tracking

The second a very prominent theme that emerged from the rank order data was the distinct opposition to health surveillance and obesity tracking strategies. The proposed solutions included *Hire additional school nurses to track obesity development in students* and *Computerized obesity tracking program managed by school.* Solutions were presented in the Access to quality health services focus area, which is geared at enhancing primary care and preventative care services to all persons (Chapter 1, CDC, 2000). This finding of low support is consistent with data reported by the CDC regarding low levels of acceptance of preventative health measures such as colorectal cancer screening and sexually transmitted disease screening (Chapter 1, CDC 2000, p. 1-4). Additional relationships between income and enhanced skepticism and value of preventive services have been noted to influence levels of acceptance (Partnership for Prevention, 1999).

Relative to obesity prevention, the proposed surveillance and tracking screening tactics involved information gathering to identify where the biggest gaps exist in receiving needed education and health care services. Such strategies are commonly used in cross-sectional epidemiological studies to illustrate health trends between behaviors and health outcomes (Berkey et al., 2000; Epstein, Paluch, Gordy & Dorn, 2000; Kelder et al., 1993). Collected information is often disseminated as a means to prioritize health disparities across populations and design action plans for addressing such issues. The data from this study reported low support

for similar strategies. Implications of this lack of acceptance of solutions that involve surveillance may be indicative of perceived effectiveness and the immediate impact of such techniques. Another interpretation of this observed trend could be representative of parent skepticism of paternalistic influence in the private lives of individuals. Throughout the data collection, several participants verbally expressed to the researcher dislike of "all this government involvement." Such prerogative deserves further investigation as organizations such as the Institute of Medicine have emphasized the need for obesity prevention to become a "National Priority", may be futile attempts if some form of government are not backing the efforts and even more so if citizens are in opposition.

Opposition to Legislative Nutrition Regulations

The third theme prominent in these data was the opposition to social level nutrition initiatives. Specifically solutions that indicated legislative action such as *Enhanced legislative funding of obesity-related nutrition programs and research* and *Increase tax on high fat foods*. The noted opposition of corporate level solutions is consistent with previous investigations. For instance, Cummings and Health Interactive (2006) revealed strategies receiving least parental support (N=432) included local government zoning regulations of fast food restaurants near schools and government related regulations of food advertising. Further, Gostin (2007) suggested that critics of government-based nutrition regulations often argue that "people are capable of deciding what to eat, and making the trade offs between taste, current pleasures, and the future health consequences" (p. 90). This stance clearly positions the development of obesity, as related to dietary habits, a responsibility of the individual. Scholars have disagreed, positioning the balance of dietary behaviors in a category influenced by environmental, cultural, and

socioeconomic components (Ekelund et al., 2005; Gordon-Larsen et al., 2003; Sherry et al., 2004).

Recognition of issues such as food insecurity (i.e., limited access to safe and nutritious food) and under nutrition has led to initiatives based within school-settings to education about nutrition and healthful eating habits (Kelder et al., 1996; Gortmaker et al., 1998), which were shown to be most strongly supported by participants in the current study. Participants highly ranked school-based regulations of food offered in school lunches to be modified and the reduction of sweets to be brought into school classrooms. The National School Lunch Program has been reported to serve lunch to almost 30 million students, approximately 60 percent of the total student population (Economic Research Service, 2007). While current guidelines requires school lunch nutritional regulations require no more than 30 percent of calories to come from fat (Burghardt, Gleason, Sinclar et al., 2004) the eminent parent support of modifications to school lunches is clear. Government regulations established by the United States Department of Agriculture serve to guide the school lunch program and continued assessment. Therefore, while the trends in these data evoke an anti-government involvement in nutrition-based solutions, the support of school lunch modifications would signify contradiction.

The potential contradiction is asserted through a lack of support for legislative action in one area and enhanced support for legislative action in another. It would seem that increased governmental regulations on unhealthful food marketing, if enacted could be a positive step in regulations of school food choices for children. Yet, this speculation can only be made in light of the limited scope of nutrition-based solutions provided on the instrument.

Summary

In summary, the newly developed survey instrument embodied a set of potential solutions to childhood obesity. While several patterns emerged from these data it is important to recognize that there was a wide variety of solutions that would be supported by this sample population. The benefit of this instrument is that the three themes that arose from this sample, could serve to guide future obesity prevention programs targeting this population. Therefore the implication of gathering this data within a representative sample of stakeholders is that vital insight to valued programs will assist in the design and implementation of obesity prevention strategies.

It is important to recognize that within the complexities of childhood obesity, there are no one-size-fits-all solutions. Many factors contribute to the necessity of obesity prevention, moreover the perceived need and value of a program can have influence as well. This magnifies the need for this instrument as it organizes solutions strategies across content types and social context. These data provide encouragement that parent participants noted support for a variety of types of programs within multiple social contexts. The diversity of support suggests that parents may be open to new and uncharted territory to be explored relative to solving childhood obesity. However, what remains is the necessity of a unified and consistent agenda of enhancing the health of children.

Childhood Obesity Locus of Control and Potential Solutions Interaction

The current investigation has successfully captured two seemingly correlated domains: beliefs and behaviors. Previous studies have shown types of treatment to interact with health locus of control in determining treatment outcomes (Wallston & Wallston, 1980). That evidence suggests that it may be useful to tailor treatments to individual differences in locus of control (Wallston et al., 1978). For example, in their experimental study Manno and Martston found that

externally oriented participants weighed more but lost less weight than the internally oriented control group participants (1972). Another early study found overweight women to possess more external health locus of control beliefs, however their behaviors related to gathering information and self-learning did not differ from internal oriented women (O'Bryan, 1972).

While no known connections between childhood obesity locus of control beliefs and support of solutions to obesity have been found, there appears to be a logical correlation between what parents believe to cause and what they would support to help solve childhood obesity. However, only a slight interaction between these two constructs was identified. The use of the newly established factor of Internality within this specific condition context (childhood obesity) did not reveal stable or consistent trends between groups of high and low Internality beliefs. Therefore, the inconsistencies of these data made it difficult to substantiate any confirmatory conclusions. It is recommended that as the instrument is further strengthened and validated within the childhood obesity locus of control construct, then subsequent investigation of this correlation be examined.

Instrument Limitations

The findings of this study should be interpreted with caution due to the following limitations. First, the sampling method was not truly random as it was based primarily on a convenience sample, of which resulted in an overrepresentation of middle-aged, tertiary educated females (aged 31-50 years) with moderate to high family incomes (>$51,000). A possible reason for the homogeneity of the sample may be the method of convenience sampling and the propensity of volunteers who would complete a survey instrument. Gaining access to participants with the time and agreeability to complete the instrument required the researcher to seek access to events and/or organizations by means of the coordinators and point persons. If access was

granted, there may have been implications of similar values and awareness of childhood obesity as a social concern. Therefore, the demographic profile of the participants was a function of research access and ability to distribute the survey to diverse population samples. The overrepresentation of Caucasian females may also provide insight to the propensity of individuals who may complete a paper/pencil or an electronic based survey.

Another implication of the demographic distribution may be attributed to the type of events and organizations that were sought for participant recruitment. Several of the data collection opportunities included sports or physical activity related events, such as youth swimming meets or fun run fundraisers, where people in attendance may already have high health values and are aware health related issues. Similarly, the electronic snowball sampling may have been distributed to acquaintances of the point persons who possess similar values and belief systems- therefore enhancing the homogeneity of the sample.

The second noted limitation is the potential restrictive nature of the response format in the Solution section. Conclusions were established based upon participant ranking of the pre selected obesity solutions, which was required without an alternative write-in or no choice option. Some participants noted that the solution groupings could not be ranked in successive order- this was evident in participant responses where all items were associated with the same value (i.e., all were labeled as 4- least support). While these particular data sets were omitted from the final analysis, there presence may be indicative of subsequent evaluation of the selection items or the response format.

The third potential limitation was the low to moderate variance explained by the childhood obesity locus of control items (48%). Although the value is consistent with previous investigations of similar constructs (Covic et al., 2007; Hardus et al., 2003) the remaining

unexplained variance may be perceived as too low for a research based instrument. However, given that the executed steps within the current study resulted in the development of a new survey instrument was capable of capturing 46 percent of the variance within four well-defined, stable factors, it is believed to be suitable for such an exploratory effort. A potential explanation of the moderate variance explained could be attributed to the homogenous sample distribution. Additional variance may be explained if greater demographic diversity or geographic regions had been sought.

Recommendations

The acknowledged instrument limitations necessitate the identification of recommendations for future study. First, within the childhood obesity locus of control, it is essential that subsequent investigation of parent perspectives on a) genetics and b) powerful others (both inside and outside the home) be undertaken. Such investigations will enhance the understanding of perceived causes of childhood obesity and provide insight to the discrepancies noted in variance explained and the individual factors. This process would require focus groups or open-ended questionnaires to address this specific issue.

The second recommendation relates to delineating the child's age on the instrument. Several participants noted challenges of responding to obesity locus of control items because the child's age was not indicated. Qualitative participant debriefing comments tended to coincide with the notion that children under a certain age were less responsible for food choices and activity behaviors than older children. This concept was reinforced by Young-Hyman, Herman, and Scott (2000) who stated "unlike adults, children are only partially responsible for their eating and exercise choices" (p. 241). If this recommendation is enacted it would be interesting to

examine the relationship between perceived childhood obesity locus of control and the age of the children.

Next, it will be essential to examine the demographic profile of respondents holding particular beliefs and their perceived solutions. The current study captured demographic information, but did not utilize the data in the analysis primarily because of the exploratory nature of the study. However, in future examinations it would be vital and useful to determine variations among the measured constructs and demographic characteristics. Additionally, being that the sample distribution of this current study was not particularly diverse, subsequent studies should enhance sampling techniques to be more representative of the population of interest. In order to do this and to better represent ethnic and racial populations, it would be essential to translate the instrument into prominent languages evident within the sampling area.

Additional validity and reliability studies should be conducted with this instrument to assist in the establishment of this newly developed instrument. Providing evidence of the psychometric soundness of the instrument will then allow for future examinations of various stakeholders, such as administrators, legislators, teachers, general practitioners perceptions of childhood obesity locus of control and potential solutions items. Further, evaluating parent perceptions as compared to other stakeholders within communities in subsequent studies may provide practical data sets that may reflect similarities and differences in stakeholder locus of control beliefs and support of childhood obesity prevention strategies.

Finally, it is recommended that studies be designed to utilize this survey instrument as tool to measure the locus of control and solutions to childhood obesity attitudes of parents and stakeholders within a distinct population or community. The interpretation of the responses from the survey group would then provide insight to the held beliefs of the causes of childhood obesity

and identify solutions that would be supported and valued. Having such information can then be used as a means to design appropriate obesity programming that is aligned with the beliefs and values of parents and stakeholder invested in the health and wellbeing of their children.

Summary

The purpose of the study was to develop a survey instrument to measure parent perceptions of (a) childhood obesity locus of control and (b) potential solutions to childhood obesity. In an attempt to operationalize childhood obesity locus of control, Benson and Clark's (1982) reiterative pilot testing approach. This was facilitated by the contributions of 622 pilot participants in the establishment of preliminary evidence of the instrument's reliability and validity as a research instrument. An important outcome of the current study was the exploratory factor analysis data, which revealed four core factors contributing to childhood obesity locus of control. Accounting for 46 percent of the total variance these factors included: Internality, Chance-Externality, Powerful Others-Outside the Home, and Powerful Others-Inside the Homes. Of most significant were the Internality (α= .718) and Chance-Externality (α= .654) factors as both depicted high reliability coefficients across pilot tests.

Given that this was the first attempt at operationalizing childhood obesity locus of control, these findings are encouraging and should be viewed as a substantial step forward in capturing parental perceptions of the very complex condition of childhood obesity. Additionally, an outcome of this study is a usable data collection instrument that can be used by public health educators, practitioners, and policy-makers to yield vital stakeholder data to guide the development and implementation of valued and supported obesity prevention strategies.

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APPENDIX A

CENTER FOR DISEASE CONTROL AND PREVENTION *HEALTHY PEOPLE 2010* OBJECTIVES

Center for Disease Control and Prevention's *Healthy People 2010* Objectives Related to Childhood Obesity

Focus Area	Objective
1 Access to Quality Health Services	1-3. Increase the proportion of persons appropriately counseled about health behaviors.
7 Educational and Community-Based Programs	7-2. Increase the proportion of middle, junior high, and senior high schools that provide school health education to prevent health problems in the following areas: unintentional injury; violence; suicide; tobacco use and addiction; alcohol and other drug use; unintended pregnancy, HIV/AIDS, and STD infection; unhealthy dietary patterns; inadequate physical activity; and environmental health.
8 Environmental Health	8-2. Increase use of alternative modes of transportation to reduce motor vehicle emissions and improve the Nation's air quality.
	8-20. (Developmental) Increase the proportion of the Nation's primary and secondary schools that have official school policies ensuring the safety of students and staff from environmental hazards, such as chemicals in special classrooms, poor indoor air quality, asbestos, and exposure to pesticides.
19 Nutrition and Overweight	19-1. Increase the proportion of adults who are at a healthy weight.
	19-3. Reduce the proportion of children and adolescents who are overweight or obese.
	19-5. Increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit.
	19-6. Increase the proportion of persons aged 2 years and older who consume at least three daily servings of vegetables, with at least one-third being dark green or orange vegetables.
	19-7. Increase the proportion of persons aged 2 years and older who consume at least six daily servings of grain products, with at least three being whole grains.
	19-8. Increase the proportion of persons aged 2 years and older who consume less than 10 percent of calories from saturated fat.
	19-9. Increase the proportion of persons aged 2 years and older who consume no more than 30 percent of calories from total fat.

Center for Disease Control and Prevention's *Healthy People 2010* Objectives Related to Childhood Obesity

Focus Area	Objective
	19-10. Increase the proportion of persons aged 2 years and older who consume 2,400 mg or less of sodium daily.
	19-11. Increase the proportion of persons aged 2 years and older who meet dietary recommendations for calcium.
19 Nutrition and Overweight	19-12. Reduce iron deficiency among young children and females of childbearing age.
	19-15. (Developmental) Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at school contributes to good overall dietary quality.
	19-17. Increase the proportion of physician office visits made by patients with a diagnosis of cardiovascular disease, diabetes, or hyperlipidemia that include counseling or education related to diet and nutrition.
	19-18. Increase food security among U.S. households and in so doing reduce hunger.
22 Physical Activity and Fitness	22-6. Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days.
	22-7. Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion.
	22-8. Increase the proportion of the Nation's public and private schools that require daily physical education for all students.
	22-9 Increase the proportion of adolescents who participate in daily school physical education.

Center for Disease Control and Prevention's *Healthy People 2010* Objectives Related to Childhood Obesity

Focus Area	Objective
	22-10. Increase the proportion of adolescents who spend at least 50 percent of school physical education class time being physically active.
	22-11. Increase the proportion of adolescents who view television 2 or fewer hours on a school day.
22 Physical Activity and Fitness	22-12. (Developmental) Increase the proportion of the Nation's public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations).
	22-14. Increase the proportion of trips made by walking.
	22-15. Increase the proportion of trips made by bicycling.

APPENDIX B

INSTITUTE OF MEDICINE'S *IMMEDIATE STEPS FOR CONFRONTING THE ISSUE*

Institute of Medicine's *Immediate Steps for Confronting the Epidemic*

FEDERAL GOVERNMENT

- Establish an interdepartmental task force and coordinate federal actions
- Develop nutrition standards for food and beverages sold in schools
- Fund state-based nutrition and physical-activity grants with strong evaluation components
- Develop guidelines regarding advertising and marketing to children and youth by convening a national conference
- Expand funding for prevention intervention research, experimental behavioral research, and community-based population research; strengthen support for surveillance, monitoring and evaluation efforts

INDUSTRY AND MEDIA

- Develop healthier food and beverage product and packaging innovations
- Expand consumer nutrition information
- Provide clear and consistent media messages

STATE AND LOCAL GOVERNMENTS

- Expand and promote opportunities for physical activity the community through changes to ordinances, capital improvement programs, and other planning practices
- Work with communities to support partnerships and networks that expand the availability of and access to healthful foods

HEALTH CARE PROFESSIONALS

- Routinely track body mass index (BMI) in children and youth and offer appropriate counseling and guidance to children and their families

COMMUNITY AND NONPROFIT ORGANIZATIONS

- Provide opportunities for healthful eating and physical activity in existing and new community programs, particularly for high-risk populations

STATE AND LOCAL EDUCATION AUTHORITIES AND SCHOOLS

- Improve nutritional quality of foods and beverages served and sold in schools and as part of school-related activities
- Increase opportunities for frequent, more intensive, and engaging physical activity during and after school
- Implement school-based interventions to reduce children's screen time
- Develop, implement and evaluate innovative pilot programs for both staffing and teaching about wellness, healthful eating, and physical activity

PARENTS AND FAMILIES

- Engage in and promote more healthful dietary intakes an active lifestyles (e.g., increased physical activity, reduced television and other screen time, more healthful dietary behaviors)

Note: From ***Preventing Childhood Obesity: Health in the Balance, 2005, Institute of Medicine www.iom.edu***

APPENDIX C

PRE PILOT STUDY INFORMATIONAL LETTER

Dear Parent,

You are invited to participate in a research project titled, *What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity*. Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will be completing a short open-ended questionnaire in which you will provide you opinions about childhood obesity and obesity prevention to assist in subsequent item development. It is estimated that this will take approximately 10 minutes of your time.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, no personal identifiable information will be collected at any time, so your responses will remain anonymous. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. If questions have been answered to your satisfaction, by continuing with the above noted procedures you agree to participate in this study.

Thank you. You may keep this letter for your records.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia
706-542-4210

APPENDIX D

PRE PILOT STUDY OPEN ENDED QUESTIONS

Parents Perceptions of Solutions to Childhood Obesity

DIRECTIONS*:* Please complete the following questions.

1. What do you believe to be the cause(s) of obesity in children?

2. Please describe what influences your attitudes toward childhood obesity prevention.

3. RANK the top 5 obesity prevention strategies that you would support if implemented in your community (1= most support).

( ) nutrition education for children

( ) increase school-based PE time

( ) more sidewalks

( ) increase # of sport programs

( ) improve school lunch options

( ) nutrition education for parents

( ) eliminate vending machines in schools

( ) schools track body mass index

( ) higher taxes on low nutrition foods

( ) regulations on food advertisements targeting kids

( ) ensure safety in my neighborhood

( ) limit TV time at home

( ) evaluate parental eating habits

( ) family involvement in health programs

( ) government funded physical activity programs

( ) more walking and bike paths

( ) increase playground quality

Others: _____

_____

_____

4. Who do you believe to be responsible for reducing childhood obesity?

5. When writing questions for a questionnaire, it is important to use words which people are familiar with and use in everyday language. Please look at the list of descriptive expressions below. Please draw a line through any expression if it is one that you would probably not use to describe your attitude toward preventing childhood obesity.

useful	my responsibility	necessary	wasteful
elitist	never	fat mass	very serious problem
obese	healthy	needed	potential
meaningful	concern(ed)	overweight	contributing factors
meaningless	body mass index	unhealthy	unconcerned
fat	responsible	useless	futile
always	role	significant	pointless
strongly support	excess adipose tissue	obligation	
strongly reject		guilt	

6. In your opinion, what should the federal government do, if anything, to assist in the prevention of childhood obesity?

7. In your opinion, what should the state/local government do, if anything, to assist in the prevention of childhood obesity?

8. In your opinion, what should the media do, if anything, to assist in the prevention of childhood obesity?

9. In your opinion, what should the educational agencies and schools do, if anything, to assist in the prevention of childhood obesity?

10. In your opinion, what should the medical community do, if anything, to assist in the prevention of childhood obesity?

11. In your opinion, what should parents do, if anything, to assist in the prevention of childhood obesity?

APPENDIX E

PRE PILOT SUDY OPEN ENDED QUESTIONS RESULTS

Parents Perceptions of Solutions to Childhood Obesity

DIRECTIONS*:* Please complete the following questions.

12. What do you believe to be the cause(s) of obesity in children?
    1. "There isn't enough exercising in school"
    2. "Family history, time (lack of planning meals), schedule convenience of the drive thru"
    3. "Busy schedules causing poor food choices by parents, children watching more TV and playing video games"
    4. "Parents don't really watch carefully, how bad their kids are eating. "The Fast Life". Kids tend to eat out a lot here in the U.S. As well as sodas and school lunches may cause obesity"
    5. "soda, fries, food in schools, video games"
    6. "Parents don't have time to cook"
    7. "Less time for parents to make dinner leads to more fast food. Children are less active-more TV watching and video games"
    8. "fast food, TV, video games"
    9. "The bad habits to eat at home, at school too, no vegetable, some fruits and not enough water and juice. Sometimes not enough money probably or just bad information about the good habits to be healthy"
    10. "Watching too much TV, too many video games, eating out at fast food"
    11. "Genes, Diet Habit, Exercise Habit, Parental Influence, Education from School, Education from the community, Commercials, Peers"
    12. "Unhealthy diet and lack of exercise/physical activity"
    13. "An unhealthy diet and lack of exercise, genetic factors"
    14. "Lack of adequate exercise, lack of nutritious food, Lack of support from family and society at large"
    15. "Sugar intake level, Genetics"
    16. 'Lack of understanding (nutrition) in parents, laziness (perhaps reinforced by parents), parents not pushing kids away from TV/games, genetics"
    17. "Emotional issues (using food as comfort), Poor diet (not making good foods available so kids choose (or only have access to) high calorie/high fat foods"

2.Please describe what influences your attitudes toward childhood obesity prevention.
    1. "Having kids of my own. Keeping them very active during and after schools."
    2. "Lack of activities- family involved and lack of overall involvement"
    3. "The rise in obesity each year in children"
    4. "I really try to make as much homemade food, than eating McDonald's on the ways back from school or home."
    5. "I am a personal trainer and I encourage everybody to workout and eat better"
    6. "News reports about increasing health risks for overweight children"
    7. "Rx- increasing about of ADHD, News reports"

8. "Will be good not eat junk food and prepare healthy food at home, prevent them about the TV commercial, about McDonalds, Burger King food"
9. "seeing overweight children everywhere I go"
10. "Online news (but I don't buy into all the info)"
11. "News programs, personal experiences with children"
12. "Research that has focused on health (weight gain and loss) issues, health magazines (eg., Prevention)"
13. "Working with public health professionals, reading newspapers, magazines, radio (NPR)"
14. "TV"
15. "My own experiences (when I work out I lose weight), observations of others, medical reports"
    a. "Personal experience (being a teacher, family, childhood), media (mainly news- newspapers, magazines, TV/radio news)"
16. n/a
17. n/a

3 RANK the top 5 obesity prevention strategies that you would support if implemented in your community (1= most support).

( ) nutrition education for children

( ) increase school-based PE time

( ) more sidewalks

( ) increase # of sport programs

( ) improve school lunch options

( ) nutrition education for parents

( ) eliminate vending machines in schools

( ) schools track body mass index

( ) higher taxes on low nutrition foods

( ) regulations on food advertisements targeting kids

( ) ensure safety in my neighborhood

( ) limit TV time at home

( ) evaluate parental eating habits

( ) family involvement in health programs

( ) government funded physical activity programs

( ) more walking and bike paths

( ) increase playground quality

Others: _____

_____

_____

4 Who do you believe to be responsible for reducing childhood obesity?

1. "Parents should make sure kids are eating correctly and exercising each and every day"
2. "Parents, guardians, and caretakers"
3. "Healthy meals, limited TV and video games. Educate the parents"
4. "Try to show less commercials about fast food spots"
5. "Healthy food, more active lifestyle, parents ed"
6. n/a
7. "child's parents"
8. parents
9. "Everybody, not just parents, but school and government implementing more support programs for health"

10. “Increased awareness”
11. “Parents, entire society, surrounding community, government”
12. “Parents and children can both play a role. Socially, people should also look to the unhealthy school lunches/breakfast provided for children. How can kids make healthy choices without healthy options?”
13. “Depending on the age of the child (1 to 12 years) Parents, Parents should provide children with healthy choices, above age 12 it’s shared responsibility (both parents and child)”
14. “Parents primarily”
15. “TV commercials, food industry, parents”
16. “Parents”
17. “Everyone- we got people to stop smoking through a vigorous government sponsored media blitz; why not obesity?”

5 When writing questions for a questionnaire, it is important to use words which people are familiar with and use in everyday language. Please look at the list of descriptive expressions below. Please <u>draw a line through</u> any expression if it is one that you would probably <u>not</u> use to describe your attitude toward preventing childhood obesity.

useful	my responsibility	necessary (1)	wasteful (5)
elitist (11)	never (6)	fat mass (5)	very serious problem
obese (1)	healthy	needed	potential
meaningful	concern(ed)	overweight (1)	contributing factors
meaningless (4)	body mass index (2)	unhealthy (2)	unconcerned (4)
fat (7)	responsible	useless (6)	futile (7)
always (3)	role (1)	significant	pointless (6)
strongly support	excess adipose tissue (13)	obligation (3)	
strongly reject (7)		guilt (5)	

6In your opinion, what should the federal government do, if anything, to assist in the prevention of childhood obesity?

1. "make sure students are exercising everyday"
2. "Offer more awareness programs available , more involvement in educating parents"
3. "Educate schools and parents more"
4. "Try to switch up the school lunches, which is where children spend most of their time. Less Coke machines"
5. "Improve school lunch food"
6. "More mandatory programs at schools for parents"
7. "It should not be a federal issue"
8. "Provide more funding to the schools"
9. "Free health insurance for poor children's'"
10. "Increased programs at schools. Better nutrition in the school cafeteria"
11. "1) Reduce the tax for healthy choice of food (ex. vegetable); 2) Give more guideline/regulations on commercial; 3) Provide more funding for research institute"
12. "Improve/regulate school lunch programs"
13. "-Stipulate laws that allow school to provide only healthy meals at lunch –Ban vending machines at schools – Make healthy foods cheaper"
14. "Improve school lunch program – support farmers who grow varied, nutritious food instead of just corn/soybeans (i.e., Farm Bill)"
15. "Funding for research related to the topic"
16. "Nothing really (they don't do much right;( )"
17. "Step up cultural campaign- like with smoking. More ads promoting healthy eating"

7 In your opinion, what should the state/local government do, if anything, to assist in the prevention of childhood obesity?

1. "Not allowing fast food in the schools"
2. "Offer inexpensive programs educating and promoting involvement"
3. "N/A"
4. "Do more family orientation and activities to educate"
5. n/a
6. "Make sure parents are aware of the problem may be decrease the taxes on nutritional food"
7. "They could plan more PE programs and make PE a requirement (more than 1 semester) for graduation.
8. "Provide more funding and education"
9. "To be aware about TV commercials and give some advise about good habits TV programs"
10. "same as above"
11. "1) Provide different types of activities for the public to join; 2) Give some workshop to parents and kids on what to eat and how to exercise"
12. "School lunch program regulation, raise awareness in schools through PTA presentations, school assembly, teacher and parent education. Increase funding for student health programs"
13. "Mandatory Physical Education classes"

14. “Increase parks, sidewalks, safety; Improve school lunch”
15. “Spending more money on research examining the effects of various prevention programs”
16. “Since states fund education, there are things to do in terms of creating gym classes that are better (maybe part of biology)”
17. “Programs for children to participate in where they are active or at least not at home sitting on the couch”

8 In your opinion, what should the media do, if anything, to assist in the prevention of childhood obesity?

1. “Start showing food that is good for the body”
2. “Limit advertisement on videogame. Promote more awareness fun activities that involve family”
3. “Promote healthy living, food awareness”
4. “try to show less commercials about fast food spots”
5. “less advertising about bad food”
6. “more health awareness programs’
7. “limit commercials for fast food”
8. “fast food commercials should be eliminated or at least limited”
9. “commercials about the good food vegetables, juices, fruit”
10. “minimize ads for fast foods/ cereal/ junk food”
11. “Encourage healthy activities, highlight children’s sporting events (locally)”
12. “Provide warning labels for unhealthy products (for example like what is done for cigarettes)”
13. “Restrict ads of unhealthy food aimed at young children”
14. “Less TV commercials on food with high sugar contents but little nutrition”
15. “Don’t know- if parents wouldn’t buy crap for their kids it wouldn’t matter if it was advertised—so for me it comes back to the parent”
16. “I think if we change our ways the media will quit advertising bad foods”
17. n/a

9 In your opinion, what should the educational agencies and schools do, if anything, to assist in the prevention of childhood obesity?

1. “Provide healthy foods for students”
2. “Not sure if they do already but providing a schedule of meals”
3. “Promote ways for children to live healthy. Make food (healthy) more appealing to kids”
4. “Give more choices of PE activities, something that they can really enjoy”
5. “better options at lunch time”
6. “awareness”
7. “Require more PE courses in school”
8. “Provide more options and choices at lunches”
9. “some more of this wellness programs at weekends”
10. “track BMI”
11. “Educate teachers, students, parents on healthy habits”
12. “Better education (nutrition & fitness) More PE, recess”
13. “Offer nutritious lunches at the cafeteria (with low sugar level)

14. "See #7"
15. "Serve healthier foods in schools /no vending machines and but be careful not to focus on restriction (this may mean staff development about eating disorders)"
16. n/a
17. n/a

10 In your opinion, what should the medical community do, if anything, to assist in the prevention of childhood obesity?
1. "Talk to parents more about their children's eating habits"
2. "Provide activities /events like this [health fair] where information is provided to promote healthy habits as opposed to what families are doing "wrong""
3. "Offer health screening and educate on healthy lifestyles"
4. n/a
5. "? Can't read it"
6. "n/a"
7. "Educate parents at children's yearly physical and give examples for what children can do"
8. "Provide more programs to teach the community about the importance of childhood obesity"
9. "each weekends give some free childhood appointments for obesity prevention"
10. "talk more BMI at check up"
11. "Go into the schools to educate about healthy eating and living habits"
12. "Provide information to parents & kids about health dangers make referrals to nutritionists"
13. "Prescribe more efficient drugs to treat the symptoms"
14. "Not try come up with quick cures"
15. "Pay attention to patients' needs really listen"
16. n/a
17. n/a

11. In your opinion, what should parents do, if anything, to assist in the prevention of childhood obesity?
1. Be sure children are eating correctly."
2. "Become familiar with family history. Eat with kids, planned family meals, Go out as family- now and days it seems as if there is no time for anything. Learn how to make time"
3. "Make time to cook more healthy meals. Spend some time outdoors playing and exercising. Stop buying so much junk food and allowing kids to eat it all the time"
4. "Start focusing more on what their kids eat. Stop going out to eat so much out to restaurants and fast food places"
5. "Be a better role model for kids"
6. "n/a"
7. "Limit high fat snacks in the home and prepare healthy food as opposed to the processed, high calorie foods or fast foods"
8. "set an example—choose healthy items to eat
9. "support with some programs with community work"

10. “pay attention to nutrition and watching too much TV”
11. “Watch what they buy for kids to eat and encourage active play”
12. “Provide healthy food choices”
13. “Restrict T.V.; Make kids go out and play; Don’t buy a lot of junk food; Prepare healthy meals”
14. “Prepare nutritious diets to the family encourage kids to exercise more”
15. “Role model good habits; Look at themselves; Demand kids get outside and move; Have healthy food and snacks; Don’t talk about diet (just healthy lifestyle)”
16. “Healthier food options”
17. n/a

APPENDIX F

INITIAL ITEM POOL
SECTION 1 AWARENESS AND ATTITUDES (31 Items)

1. There are few social issues that are more important than childhood obesity.
2. The number of media stories on childhood obesity is an indicator of the magnitude of the epidemic.
3. Greater social action must be taken now to reduce and prevent childhood obesity.
4. I would support childhood obesity prevention programs with my tax dollars.
5. There is no greater social issue that needs immediate attention than childhood obesity
6. In my opinion, cost should non-issue when designing obesity prevention programs
7. I would give personal money towards childhood obesity prevention programs.
8. Childhood obesity affects us all; therefore, it is a social responsibility to alleviate the issue.
9. Long-term benefits of childhood obesity prevention will outweigh the costs.
10. If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.
11. Childhood obesity is a real social issue that is need of attention.
12. Childhood obesity affects many and requires preventative action.
13. Even though my childhood may not be obese, I know it affects many and preventative efforts should be socially supported.
14. Current spending on childhood obesity is insufficient.
15. I do not know enough about childhood obesity to know if it is a social problem
16. If childhood obesity were such a problem, more social programs would already be in place to confront the issue.
17. I do not know how much money is spent on childhood obesity.
18. Childhood obesity is a non-issue to me.
19. Although the media says childhood obesity is a problem, I do not think it's as bad as they say.
20. Current spending on childhood obesity is sufficient.
21. I do not think as many people are affected by childhood obesity as the media portrays.
22. More important social issues deserve attention rather than childhood obesity.
23. Too much government money is already spent on childhood obesity.
24. My children are not obese, so I should not have to pay for others who are.
25. I do not want my tax dollars spent on childhood obesity prevention.
26. I would not contribute any personal money to prevent childhood obesity.
27. Information about childhood obesity is always exaggerated.
28. Childhood obesity is a personal issue, not a social one.
29. No social action should be taken to prevent childhood obesity.
30. No federal money should be spent on childhood obesity.
31. Childhood obesity is not preventable, so spending money on it would be wasteful.

APPENDIX G

INITIAL ITEM POOL
SECTION 2 CHILHOOD OBESITY LOCUS OF CONTROL (36 Items)

Dimensions:

1) Internality- existing, evident in, or arising from the nature, structure, or qualities that somebody or something has
2) Powerful Others Externality: an outward form or appearance, or anything that is outside or external to somebody or something
3) Chance Externality: by means of fate, luck, or happenstance

Internality Items

11. I believe children have control over their obesity.
12. A child's consumption of high fat food contributes to his/her obesity
14. A child's habitual physical inactivity is a major factor of his/her obesity
31. Obesity in children is a result of the time one spends playing video games each day.
    An obese child has the choice to become healthy.
    If a child is obese, it is a result of his/her own actions.
    If a child is obese, it is a result of his/her own behaviors.
    If a child is obese, it is a result of his/her decisions.
    Obese children could change if they wanted to.
    Children are in control of their weight (close wording to MHLC #6)
    When a child is obese, he/she is to blame (close wording to MHLC #8)
    The main thing which affect child's obesity is what they do (close wording to MHLC #12)
    If a child takes care of him/herself, he/she can avoid becoming obese (#13)
    If a child really wanted to lose weight, he/she would take the right actions
    I do not believe children have control over their obesity. (Negatively worded)
    A child cannot be to blame if he/she is obese. (Negatively worded)
    A child's behaviors are not the reason for their obesity. (Negatively worded)
    Children are not in control of their weight. (Negatively worded)

Chance Externality Items

2. Genetics is a primary cause of obesity in children
    It is by luck that some children are obese.
    It is by luck that some children are normal weight
    No matter how hard some try, they will always be obese.
    It is no one's fault that children are obese
    No one is to blame when a child is obese
    It is by chance that children develop obesity
    If it is meant to be, my child will become obese (close wording to MHLC #16)
    Luck plays a big part in determining who will become obese (close wording to MHLC #9)
    Luck plays a big part in determining which children are obese (#9)
    Luck plays a big part in determining which children will become obese (#9)
    No matter what obese children do, they will always be obese

I cannot believe that chance is the cause of obesity in children (negatively worded)
Someone or something is responsible for obesity in children, not luck. (Negatively worded)
Luck has nothing to do with determining who will become obese. (Negatively worded)
Pro-active strategies can reduce obesity in children. (Negatively worded)

Powerful Others Externality Items

3. The media's powerful influence contributes to the development of obesity in children.
5. Parents are responsible for the development of obesity in their children.
37. Fast food restaurants' marketing of high fat foods to children plays a main role in childhood obesity
18. Unhealthy school lunch options play a role in obesity in kids
20. Parents' lack of proper nutritional knowledge influence obesity in their children
24. Parents' lack of proper nutritional behavior stimulates childhood obesity
27. I believe the federal government has too loose regulations on food marketing to kids
42. Childhood obesity is a result of social economic status
Poor nutritional decisions made by parents lead to obesity in their children
School lunch officials contribute to obesity development in children
School lunch officials who limit the healthy food options for children affect obesity in kids
A child's family has a lot to do with their becoming obese (#7)
A child's obesity is a result of decisions made by other people (for example, parents, teachers, friends, doctors) (#14)
Television programs targeted at children and youth affects the obesity of kids
Fast food restaurants are responsible for childhood obesity
The mass production of food in the U.S. causes childhood obesity
Children depend on powerful others to keep them healthy
The federal government is doing all it can to prevent obesity in children. (Negatively worded)
Parents should not be blamed for obesity in their children. (Negatively worded)
I do not believe other people control the obesity within an individual. (Negatively worded)
I think obesity in children is an issue of self-responsibility. (Negatively worded)

APPENDIX H

INITIAL ITEM POOL
SECTION 3 SOLUTIONS TO CHILDHOOD OBESITY (124 Items)

Social Ecological Model Level (Brofenbrenner, 1979; McElroy et al., 1988) Definitions:

Interpersonal/ Lifestyle Influences - *Interpersonal processes and primary groups (family, peers, social networks, associations) that provide social identity and role definition.*

1. Parent nutrition education programs
2. Parent physical activity education programs
3. Nutrition education geared for teachers personal knowledge
4. Nutrition education designed for teachers to integrate into classroom curriculum
5. Teachers demonstrate active lifestyle.
6. Teachers demonstrate health eating.
7. Health promotion messages and strategies aimed at teachers
8. Provide audiovisual resources for parents about obesity prevention
9. Provide audiovisual resources to teachers about obesity prevention
10. Develop forums for discussion with parents about obesity prevention
11. Develop forums for discussion with teachers about obesity prevention
12. Family involvement in school-based PE programming
13. Parents act of promoting caloric balance
14. Parents decrease child's TV viewing
15. Parents model active lifestyle for children
16. Parents engage with children in physical activities
17. Increase breast feeding duration
18. Increase breast feeding promotion
19. Child counseling on prevention of obesity by trained instructors
20. Lectures on prevention of obesity by trained instructors delivered to school-aged children.
21. Lectures on prevention of obesity by trained instructors delivered to parent groups

Institutional/ Organizational- *Rules, regulations, policies and informal structures (worksites, schools, religious groups)*

22. Daily physical activity as a part of regular curriculum for all children in the school
23. Teachers teach behavior change skills in classroom
24. Prohibit junk food or sugary sweets to be brought into classroom.
25. Provide exercise area for teachers in all schools
26. Health education curriculum taught in classrooms
27. Aerobic dance taught as part of PE curriculum
28. Interdisciplinary health education curriculum taught at schools
29. School-wide effort to discourage the consumption of carbonated beverages
30. School-wide effort to encourage fruit intake
31. School-wide effort to encourage consumption of water
32. Requiring/Encouraging school kiosks to sell healthy foods

33. Modify school physical education curriculum based on student activity interests and input from PE teacher
34. Religious groups provide exercise classes for adults
35. Religious groups provide physical activity opportunities for children
36. Religious groups sponsor healthy eating seminars
37. Enhance PE classes with information about effects of health behaviors
38. Enhance PE classes with lessons about skills to enable behavior change
39. Nutrition education as a component of health
40. Nutrition education as a component of PE
41. School-based program designed to reduce television viewing
42. School-based program designed to reduce video game use
43. Provide households with television time managers device
44. Nutrition changes at all food sources in schools
45. School and education agencies promote/sponsor active fundraisers
46. Schools and educational agencies promote/sponsor nutritious fundraisers
47. Changes required within school food services
48. Increase physical activity time during school day.
49. Modifications to school meals – reducing sodium, sugar, and fat content
50. Health education curriculum emphasizing cardiovascular physiology, eating and exercise behaviors and coping skills
51. PE program emphasize aerobic conditioning, personal fitness, CV risk factor screening, lipid profile, blood pressure, indices of adiposity.
52. Sponsor competition for miles walked to school
53. Sponsor competition for person-powered transportation to school – for both students, faculty, and staff
54. Schools open after hours for physical activity participation
55. School sporting facilities open to public outside of school hours
56. School and local parks/recreation department collaborate to share facilities

Community- ***Social networks, norms, standards (e.g., public agenda, media agenda) or other existing channels***

57. Increased number of organized sports opportunities
58. Marketing low-fat foods at schools
59. Media promotion of healthy nutrition
60. Media marketing of physical activity and play
61. Local restaurants modify children's menus to be more nutritious
62. Community sustain and promote local farmers markets
63. Community subsidizes local growers by purchasing local foods for school lunch program
64. Physical activity messages delivered on ticker at the bottom of television screen during children's programming
65. Community tax dollars fund green space rejuvenation
66. Community tax dollars fund sidewalk repair
67. Promotion to be active delivered by TV
68. Promotion to be active delivered by radio
69. Promotion to be active delivered by billboards

70. Promotion to be active delivered by Internet
71. Promotion to eat healthy delivered by TV
72. Promotion to eat healthy delivered by radio
73. Promotion to eat healthy delivered by billboards
74. Promotion to eat healthy delivered by Internet
75. Promotion to be active delivered by posters in strategic places around community
76. Promotion to eat healthy delivered by posters in strategic places around community
77. Establish walking/biking trails that are separate from roads
78. Connect walking/biking trails to residential areas
79. Connect walking/biking trails to areas of commerce (shopping areas)
80. Connect walking/biking trails to schools
81. Increase the number of parks and recreation centers
82. Increase the number of parks and recreation areas
83. Secure parking for bicycles at schools
84. Secure parking for bicycles around town.
85. Develop electronic games that require activity from children
86. Advertise after movies that encourage active play
87. Provide more parks and recreation supervised programs for children
88. Publicize incentive programs for physical activity promotion
89. Communities give rewards to local business that do the most to promote physical activity
90. Television broadcasters to provide as much airtime promoting physical activity as they do promoting their own programming
91. Nutrition promotion advertisements on television and after movies
92. Physical activity promotion advertisements on television and after movies.

Social Structure/ Policy -*Local, state, federal policies and laws that regulate or support healthy actions.*

93. Health policy meetings at schools that include students, teachers, and administrators
94. Build Student Health Committees for students to take informed positions on health issues.
95. Enforce incentives for schools to enhance healthy environments
96. Enforce incentives for schools to provide healthy food choices
97. Establish collaborative relationships between state and local governments and the private sector to….
98. Fund obesity prevention and reduction research programs
99. Fund physical activity initiatives at the local level
100. Sponsor state-wide physical activity (all ages) competition (i.e., Walk Georgia, Walk Across Iowa)
101. Leverage financial resources to combat obesity in children
102. Legislative act and enforcement related to nutrition in schools sets standards for foods available and sold in schools
103. Legislative act and enforcement related to nutrition in schools to eliminate soft drinks from school vending machines
104. Legislative acts and enforcement related to physical activity in school require school districts to incorporate daily physical activity into curricula

105. Legislative acts related to research establish new programs to study obesity-related issues
106. Increase taxes on high sugary foods.
107. Increase tax on high fat foods
108. Providing health insurance coverage for health services to improve nutrition and prevent obesity
109. Alter or control legal, social, economic or physical environment related to nutrition and physical activity
110. Increase and improve walking and biking trails
111. Closing dangerous streets near schools
112. Increase zoning and planning for parks and recreation areas
113. Improve access to physical activity opportunities for all children
114. Improve access to healthy foods
115. new walking trails,
116. community gardens,
117. changes in school cafeteria menu
118. changes in school vending machine food options
119. Provide facilities and resources for inclement weather areas
120. Health agencies should give rewards to entertainment companies that do the most to promote physical activity
121. Give rewards to states with best programs for promoting active transportation
122. Give awards to parks and recreation departments that are most effective in promoting physical activity
123. Provide funding for walking and biking trails
124. Provide more funding for park and recreation departments to start physical activity promoting programs.

APPENDIX I

INITIAL ITEM POOL
SECTION 3 SOLUTIONS TO CHILDHOOD OBESITY (81 Items)

1. Parents encourage fruit intake
2. Increase physical activity opportunities for children within the structure of the regular school day.
3. Increased community and health care professional partnerships aimed at obesity prevention
4. Establish collaborative relationships between government and schools to enhance school physical education programs
5. Eliminate hazardous household substances
6. Computerized obesity tracking program managed by parents
7. Provide more parks and recreation-supervised programs for children
8. School-wide efforts to promote fruit intake
9. Legislation to enhance funding for research of obesity-related issues
10. Reduce insurance premiums for healthy families.
11. Hire additional school nurses to track obesity development in students
12. Regular parent-only physical activity education programs
13. Develop electronic games that require activity from children
14. Prohibit junk food or sugary sweets to be brought into school classrooms.
15. Parents ensure children who have access to safe drinking water at home.
16. Local initiative to connect walking/biking trails to schools
17. Improve air quality for children to play safely outdoors
18. Increase number of parents engaging in physical activities with children
19. Schools prohibit fundraising efforts that produce revenue with poor nutritious foods
20. Community-wide interventions targeting obesity prevention and reduction
21. Increase tax on high fat foods
22. Public program and funds to improve walking and biking trails
23. Modifications to school meals – reducing sodium, sugar, and fat content
24. Pediatricians enforcement of restrictive diet for overweight children
25. Increased media exposure of healthy food choices at the local level
26. Secure parking for bicycles at schools funded by local tax dollars
27. Schools open after hours for physical activity participation
28. Computerized obesity tracking program managed by school nurses
29. Provide greater financial support for local level physical activity initiatives
30. Public incentive programs for local business that promote physical activity
31. Establish or revitalize community gardens
32. Enhance PE classes with information about the outcomes associated with obesity
33. Parent reduction of the number of trips taken by car to increase outdoor air quality.
34. Provide physical activity facilities for inclement weather areas
35. Obesity awareness seminars sponsored by local vendors
36. Community vendors and schools sponsor "Walk to School Day"
37. Religious groups provide family focused exercise classes
38. Community-wide obesity risk assessment and screening
39. Enforce incentives for schools to enhance healthy environments

40. Regular childhood obesity screening offered at a reduced rate.
41. Provide families with household television time managing device
42. Teachers model active lifestyle.
43. Nutrition promotion advertisements on television and after movies
44. Activity promotion delivered by Internet advertisements
45. Hospitals offer reduced price wellness classes to community youth
46. Develop online parent forums about obesity prevention
47. Enhanced health education curriculum to include healthy eating and exercise behaviors
48. Increase breast feeding duration
49. Financial incentives for families choosing preventative medicine options
50. Community-sponsored health fairs
51. Parents active promotion of caloric balance
52. Parents encourage the consumption of water
53. Free after-school structured physical activities for all children.
54. School and local parks/recreation department collaborate to share facilities
55. Close dangerous streets near schools during school hours
56. Increase the number of public parks and recreation areas
57. Enforced restrictions on the availability of soft drinks in school vending machines
58. Primary care physicians provide obesity prevention tips for children and parents
59. Parental restrictions on child's television viewing time
60. Recruit medical professionals who integrate obesity prevention in practices into local communities
61. Enforced requirements on daily school-based physical activity opportunities
62. Parental restrictions on child's television viewing time
63. Lectures on prevention of obesity by trained instructors delivered to parent groups
64. Community subsidizes local growers by purchasing local foods for school lunch program
65. Parents model active lifestyle.
66. Daily physical education required as a part of school curriculum for all children
67. Health and wellness components become embedded in all educational settings
68. Reduce children's exposure to smoke at home.
69. Increase zoning and planning for parks and recreation areas
70. Neighboring community physical activity monthly challenges
71. Computerized obesity tracking program managed by pediatricians
72. Develop community-based obesity surveillance division to track and communicate trends of obesity in community.
73. Provide health insurance coverage for health services to improve nutrition and prevent obesity
74. School and education agencies sponsor activity-based fundraisers.
75. Provide obesity prevention audiovisual resources for parents.
76. Development of new community walking trails
77. Promotion to eat healthy delivered by posters in strategic places around community
78. Increase the number of primary care physicians who address, diagnose, and prescribe treatment for obese children.
79. Child counseling on prevention of obesity by trained instructors
80. School-based program designed to reduce television viewing

81. Establish collaborative relationships between government and schools to enhance school-based health education programs

APPENDIX J

PILOT STUDY A INFORMATIONAL LETTER

Dear Participant,

You are invited to participate in a research project titled, *What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity*. Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the estimation of initial content validity and item discrimination. Your participation will involve completing two item sorting exercises and providing feedback on the clarity and comprehensiveness in effort to establish preliminary content validity. You will be asked to complete these tasks either electronically via an internet survey host or face-to-face; both of which would be scheduled at your convenience. It is estimated that this will take approximately 35 minutes of your time.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, any individually identifiable information obtained during this project will be kept confidential; your identity and personal information will not be disclosed or associated with your responses on the exercises or feedback. If you choose to complete this exercise electronically via an internet survey host, be aware Internet communications are insecure and there is a limit to the confidentiality that can be guaranteed due to the technology itself. However once the materials are received by the researcher, standard confidentiality procedures will be employed and any identifiable information linked to you will be removed. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. If questions have been answered to your satisfaction, by continuing with the above noted procedures you agree to participate in this study.

Thank you. You may keep this letter for your records.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia
706-542-4210

APPENDIX K

PILOT STUDY A SUBJECT MATTER EXPERTS ITEM SORTING EXERCISE I

Initial Item Analysis: Content Judge Evaluation

1. Introduction

Dear Content Expert,
Thank you for your participation in this study. Your contributions will greatly enhance the development of this survey instrument designed to measure parent's perceptions of solutions to childhood obesity.

This is Part 1 of 2 of the item sorting exercises, it will take approximately 25 minutes to complete. When you hit the NEXT button you will begin the exercise. There are two sections to this exercise a) Attitudes toward childhood obesity prevention and b) Locus of Control of childhood obesity. Please be sure to complete both sections and when finished you will see a DONE button to submit your responses.

By completing this exercise via Survey Monkey, all of your responses will be received anonymously and no personal identifiers will be associated to you.

If you have any questions please feel free to contact me via email: ejones@uga.edu or phone: 706-542-4210. This project has been approved by the University of Georgia Institutional Review Board, if you have questions you may direct your questions to them via email: irb@uga.edu or phone: 706-542-3199

I will be sending Part 2 of 2 of the item sorting exercise in one week for you to complete.

Thank you again,
Emily Jones
Dr. Paul G Schempp

DEPARTMENT OF KINESIOLOGY
THE UNIVERSITY OF GEORGIA

Page 1

Initial Item Analysis: Content Judge Evaluation

2. Attitudes Towards Childhood Obesity Prevention

Scale Orientation:
The seven-point response key below represents a continuum of seven equal intervals. The continuum is anchored at 1 and 7 which are both labeled with statements that reflect an extreme attitude of favor or opposition toward childhood obesity prevention. Category 4 is labeled 'Neutral'. The remaining numbered categories (2, 3, 5, & 6) are not labeled, but are to represent equal intervals of the stated attitude.

Judges Task:
1) Please read each item below and evaluate the item's content based upon its place along the continuum. Place a check mark in the numbered category that corresponds with the attitudes displayed on the scale. PLEASE NOTE: These are NOT MEANT TO REFLECT YOUR OPINION, but your analysis of the statements and the attitude category to which they belong. When finished each of the seven attitude categories should possess only items that reflect that specific category along the continuum.

Attitude Category Labels:
1= The attitude of a person who is EXTREMELY IN FAVOR of childhood obesity prevention.

7= The attitude of a person who is EXTREMELY OPPOSED to childhood obesity prevention.

1. Please evaluate the items below and place them within one of the seven categories along the following continuum.

	1 The attitude of a person who is EXTREMELY IN FAVOR of childhood obesity prevention.	2	3	4 Neutral	5	6	7 The attitude of a person who is EXTREMELY OPPOSED to childhood obesity prevention.
1. There is no greater social issue that needs immediate attention than childhood obesity prevention.	○	○	○	○	○	○	○
2. In my opinion, cost should be a non-issue when designing childhood obesity prevention programs.	○	○	○	○	○	○	○
3. Current spending on childhood obesity prevention is insufficient.	○	○	○	○	○	○	○
4. No federal or state money should be spent on childhood obesity prevention.	○	○	○	○	○	○	○
5. Childhood obesity prevention is a non-issue to me.	○	○	○	○	○	○	○
6. I do not know how much money is spent on childhood obesity prevention.	○	○	○	○	○	○	○
7. Greater social action must be taken now to reduce and prevent childhood obesity.	○	○	○	○	○	○	○
8. Long-term benefits of childhood obesity prevention will outweigh the costs.	○	○	○	○	○	○	○
9. Current spending on childhood obesity is sufficient.	○	○	○	○	○	○	○
10. My children are not obese, so I should not have to pay for others who are.	○	○	○	○	○	○	○
11. Obesity prevention is a personal issue, not a social one.	○	○	○	○	○	○	○
12. Energy spent on preventing childhood obesity could be used in more productive ways.	○	○	○	○	○	○	○
13. Childhood obesity requires preventative action.	○	○	○	○	○	○	○

Page 2

Initial Item Analysis: Content Judge Evaluation

14. There are few social issues that are more important than childhood obesity prevention.	○	○	○	○	○	○	○
15. If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.	○	○	○	○	○	○	○
16. I know obesity affects the health of many young people, so I believe preventative action is needed.	○	○	○	○	○	○	○
17. I do not know enough about childhood obesity to know if preventative action is necessary.	○	○	○	○	○	○	○
18. Treatment of diagnosed obesity in children will save time and money.	○	○	○	○	○	○	○
19. There are more important social issues that deserve attention before childhood obesity prevention.	○	○	○	○	○	○	○
20. Too much government money is already spent on preventing childhood obesity.	○	○	○	○	○	○	○
21. I do not want any of my tax dollars spent on childhood obesity prevention.	○	○	○	○	○	○	○
22. I would not contribute personal money to prevent childhood obesity.	○	○	○	○	○	○	○
23. No social action should be taken to prevent childhood obesity.	○	○	○	○	○	○	○
24. Pro-active obesity prevention strategies will enhance the health of young people.	○	○	○	○	○	○	○
25. I would support childhood obesity prevention programs with my tax dollars.	○	○	○	○	○	○	○
26. Obesity prevention is a personal issue and should not be a social agenda.	○	○	○	○	○	○	○
27. I would give personal money towards childhood obesity prevention programs.	○	○	○	○	○	○	○
28. Trying to prevent childhood obesity would be a complete waste of time.	○	○	○	○	○	○	○
29. Treatment of childhood obesity is more pragmatic than prevention.	○	○	○	○	○	○	○
30.Childhood obesity is not preventable, so prevention efforts would be wasteful.	○	○	○	○	○	○	○
31. If childhood obesity were such a problem, more social programs would already be in place to confront the issue.	○	○	○	○	○	○	○

Feedback on specific items (i.e., clarity, terminology use, content)

2. How could the end point labels (category 1 and 7) of the above continuum be improved to better reflect extreme attitudes?

Initial Item Analysis: Content Judge Evaluation

3. Childhood Obesity Locus of Control

Scale Orientation:
Below are 36 statements pertaining to who or what influences childhood obesity. Three dimensions of Locus of Control (Internal, External-Chance, and External-Powerful Others) are identified in the response columns. Under each dimension there is a pull-down box that has the numbers 1-5. The numbers represent the strength that the statement reflects that particular dimension of Locus of Control. See below for qualitative labels of the numeric values.

Judge's Task:
1) Please read each item and evaluate the content of the statement. Based upon your analysis, assign a numeric value (1-5) under each dimension for all statements. PLEASE NOTE: These are NOT MEANT TO REFLECT YOUR OPINION, but your analysis of the strength each statement represents the dimensions. When finished you should have three values assigned to every item.

Numeric Values:

1= Does not represent this dimension at all.

5= Most strongly represents this dimension.

1. Please read each of the following items and use the drop down menus to indicate how strongly you believe the item represents the dimension.

	Control lies within the Individual	Controlled by Chance	Control held by Powerful Others
1. If a child is obese, it is a result of his/her own behaviors.			
2. Parents should not be blamed for obesity in their children.			
3. Someone or something is responsible for obesity in children, not luck.			
4. Genetics is a primary cause of obesity in children.			
5. If a child takes care of him/herself, they can avoid becoming obese.			
6. I do not believe other people control the obesity within an individual.			
7. Children are not in control of their weight.			
8. School lunch officials influence obesity in children.			
9. It is by chance that some children are obese.			
10. If it is meant to be, my child will become obese.			
11. A child's obesity is a result of decisions made by other people in their lives.			
12. I think obesity in children is an issue of self-responsibility.			
13. Pro-active strategies can reduce obesity in children.			
14. Parents are responsible for the obesity of their children.			
15. I do not believe children have control over their obesity.			
16. An obese child is a result of his/her family's social economic status.			
17. An obese child has the choice to become healthy.			
18. I cannot believe that chance is the cause of obesity in children.			
19. Fast food restaurants are responsible for childhood obesity.			

Initial Item Analysis: Content Judge Evaluation

20. The mass production of food in the U.S. is a primary cause of obesity in kids.			
21. Parents lack of proper nutrition knowledge influences obesity in their children.			
22. The main thing that affects a child's obesity is what they do.			
23. When a child is obese, he/she is to blame.			
24. No one is to blame when a child is obese.			
25. A child's family has a lot to do with their becoming obese.			
26. Television programs targeted at children contribute to obesity in kids.			
27. If a child is obese, it is a result of his/her decisions.			
28. A child cannot be to blame if he/she is obese.			
29. No matter what obese children do, they will always be obese.			
30. I believe children have control over their obesity.			
31. Children are in control of their own weight.			
32. Luck plays a big part in determining who will become obese.			
33. It is no one's fault that children are obese.			
34. A child's behaviors are not the reason for their obesity.			
35. The federal government is doing all it can to prevent obesity in children.			
36. Luck has nothing to do with determining who will become obese.			

Feedback on specific items (i.e., clarity, terminology use, content)

2. Did the items adequately represent the 3 dimensions or were important elements missing? If so, please suggest additional content to be added (e.g., "Too few items represented ...).

3. Overall Comments or Suggestions for Improvement

Initial Item Analysis: Content Judge Evaluation

4. Thank You

Thank you for your assistance.
If you have additional questions or comments before submitting your responses please contact me via email: ejones@uga.edu or by phone: 706-542-4210.

I will be sending Part 2 of 2 which will pertain to Proposed Solutions to Childhood Obesity in one week.

Thank you.

Emily Jones
Dr. Paul G Schempp

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THE UNIVERSITY OF GEORGIA

APPENDIX L

PILOT STUDY A SUBJECT MATTER EXPERTS ITEM SORTING EXERCISE II

Initial Item Analysis- Content Judge Evaluation 2

1. Introduction

Dear Content Expert,
Thank you for your participation in this study. Your contributions will greatly enhance the development of this survey instrument designed to measure parent's perceptions of solutions to childhood obesity.

This is Part 2 of 2 of the item sorting exercises, it will take approximately 25 minutes to complete. There is only one section of this exercise and it involves the sorting of childhood obesity prevention strategies across the varying levels of the Social Ecological Model.

When you hit the NEXT button you will begin the exercise. Please be sure to complete all pages and when finished you will see a DONE button to submit your responses.

By completing this exercise via Survey Monkey, all of your responses will be received anonymously and no personal identifiers will be associated to you.

If you have any questions please feel free to contact me via email: ejones@uga.edu or phone: 706-542-4210. This project has been approved by the University of Georgia Institutional Review Board, if you have questions you may direct your questions to them via email: irb@uga.edu or phone: 706-542-3199

Thank you again,
Emily Jones
Dr. Paul G Schempp

DEPARTMENT OF KINESIOLOGY
THE UNIVERSITY OF GEORGIA

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Initial Item Analysis- Content Judge Evaluation 2

2. Obesity Prevention Strategies 1 of 4

Scale Orientation:
The four category choices below represent the social levels noted in Brofenbrenner's Ecological Systems Theory (1979) as micro-, meso-, exo-, and macro-levels of society that influence an individuals beliefs, values, attitudes, and behaviors. The description of each social level are provided below.

Judges Task:
1) Please read the items below, each represents an obesity prevention strategy implemented within different social levels. After reading the item, evaluate which social level the prevention strategy best corresponds and place a check mark in the appropriate category. If you believe the item does not fit within any of the categories, a N/A column is provided.
2) In the text box at the bottom of the page provide a brief statement about the items you placed within the N/A category OR found difficult to categorize.

Category Labels:

MICRO- (Interpersonal)= Interpersonal processes and primary groups that provide social identity and role definition (family, peers, associations).

MESO- (Organizational / Institutional) = Rules, regulations, policies, and informal structures (schools, religious groups).

EXO- (Community) = Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

MACRO- (Social Structure/Policy) = Local, state, or federal polices and laws that regulate or support healthy actions.

1. Please evaluate the items below and place them within one of the four categories.

	Interpersonal	Organizational/ Institutional	Community	Social Structure / Policy	N/A
1 Parents encourage fruit intake	◯	◯	◯	◯	◯
2 Increase physical activity opportunities for children within the structure of the regular school day.	◯	◯	◯	◯	◯
3 Increased community and health care professional partnerships aimed at obesity prevention	◯	◯	◯	◯	◯
4 Establish collaborative relationships between government and schools to enhance school physical education programs	◯	◯	◯	◯	◯
5 Eliminate hazardous household substances	◯	◯	◯	◯	◯
6 Implement and distribute a computerized obesity tracking program that is managed by parents	◯	◯	◯	◯	◯
7 Provide more supervised parks and recreation-based programs for children	◯	◯	◯	◯	◯
8 School-wide efforts to promote fruit intake	◯	◯	◯	◯	◯
9 Legislation to enhance funding for research of obesity-related issues	◯	◯	◯	◯	◯
10 Reduce insurance premiums for healthy families.	◯	◯	◯	◯	◯
11 Hire additional school nurses to track obesity development in students	◯	◯	◯	◯	◯
12 Establish bi-monthly physical activity educational sessions designed solely to inform parents	◯	◯	◯	◯	◯
13 Enhance the development of electronic games that require active participation	◯	◯	◯	◯	◯

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14 Prohibit junk food or sugary sweets to be brought into school classrooms.	○	○	○	○	○
15 Parents ensure children who have access to safe drinking water at home.	○	○	○	○	○
16 Local initiative to connect walking/biking trails to schools	○	○	○	○	○
17 Improve air quality for children to play safely outdoors	○	○	○	○	○
18 Increase number of parents engaging in physical activities with children	○	○	○	○	○
19 Prohibit schools from promoting poor nutritious foods through fund raising efforts	○	○	○	○	○
20 Community-wide interventions targeting obesity prevention and reduction	○	○	○	○	○

Please comment on items placed in the N/A category OR items that were difficult to categorize.

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3. Obesity Prevention Strategies 2 of 4

Category Labels:

MICRO- (Interpersonal)= Interpersonal processes and primary groups that provide social identity and role definition (family, peers, associations).

MESO- (Organizational / Institutional) = Rules, regulations, policies, and informal structures (schools, religious groups).

EXO- (Community) = Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

MACRO- (Social Structure/Policy) = Local, state, or federal polices and laws that regulate or support healthy actions.

1. Please continue to evaluate the items below and place them within one of the four categories.

	Interpersonal	Organizational/ Institutional	Community	Social Structure / Policy	N/A
21 Increase tax on high fat foods	○	○	○	○	○
22 Public funds spent to improve walking and biking trails	○	○	○	○	○
23 Modifications to school meals – reducing sodium, sugar, and fat content	○	○	○	○	○
24 Pediatricians enforcement of restrictive diet for overweight children	○	○	○	○	○
25 Increased media exposure of healthy food choices at the local level	○	○	○	○	○
26 Secure parking for bicycles at schools funded by local tax dollars	○	○	○	○	○
27 Schools open after hours for physical activity participation	○	○	○	○	○
28 Utilize computerized obesity tracking program that is managed by school nurses	○	○	○	○	○
29 Provide greater financial support for local level physical activity initiatives	○	○	○	○	○
30 Public incentive programs for local business that promote physical activity	○	○	○	○	○
31 Establish or revitalize community gardens	○	○	○	○	○
32 Enhance PE classes with information about the outcomes associated with obesity	○	○	○	○	○
33 Encourage parents to reduce the number of trips taken by automobile to improve outdoor air quality.	○	○	○	○	○
34 Build physical activity facilities in inclement weather areas	○	○	○	○	○
35 Obesity awareness seminars sponsored by local vendors	○	○	○	○	○
36 Community vendors and schools sponsor "Walk to School Day"	○	○	○	○	○
37 Religious groups provide family focused exercise classes	○	○	○	○	○
38 Community-wide obesity risk assessment and screening	○	○	○	○	○
39 Enforce incentives for schools to enhance healthy environments	○	○	○	○	○

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40 Regular childhood obesity screening offered at a reduced rate.	○	○	○	○	○
41 Provide families with household television time managing device	○	○	○	○	○

Please comment on items placed in the N/A category OR items that were difficult to categorize.

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4. Obesity Prevention Strategies 3 of 4

Category Labels:

MICRO- (Interpersonal)= Interpersonal processes and primary groups that provide social identity and role definition (family, peers, associations).

MESO- (Organizational / Institutional) = Rules, regulations, policies, and informal structures (schools, religious groups).

EXO- (Community) = Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

MACRO- (Social Structure/Policy) = Local, state, or federal polices and laws that regulate or support healthy actions.

1. Please continue to evaluate the items below and place them within one of the four categories.

	Interpersonal	Organizational/ Institutional	Community	Social Structure / Policy	N/A
42 Encourage teachers to model active lifestyles.	○	○	○	○	○
43 Develop nutrition promotion advertisements for television and after movies	○	○	○	○	○
44 Activity promotion delivered by Internet advertisements	○	○	○	○	○
45 Hospitals offer reduced price wellness classes to community youth	○	○	○	○	○
46 Develop online parent forums about obesity prevention	○	○	○	○	○
47 Enhanced health education curriculum to include healthy eating and exercise behaviors	○	○	○	○	○
48 Encourage increased breast feeding duration	○	○	○	○	○
49 Financial incentives for families choosing preventative medicine options	○	○	○	○	○
50 Community-sponsored health fairs	○	○	○	○	○
51 Parents active promotion of caloric balance	○	○	○	○	○
52 Parents encourage the consumption of water	○	○	○	○	○
53 Free after-school structured physical activities for all children.	○	○	○	○	○
54 School and local parks/recreation department collaborate to share facilities	○	○	○	○	○
55 Close dangerous streets near schools during school hours	○	○	○	○	○
56 Increase the number of public parks and recreation areas	○	○	○	○	○
57 Enforced restrictions on the availability of soft drinks in school vending machines	○	○	○	○	○
58 Primary care physicians provide obesity prevention tips for children and parents	○	○	○	○	○
59 Parental restrictions on child's television viewing time	○	○	○	○	○
60 Recruit medical professionals who integrate obesity prevention in practices into local communities	○	○	○	○	○

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61 Enforced requirements on daily school-based physical activity opportunities	○	○	○	○	○
62 Parental restrictions on child's television viewing time	○	○	○	○	○

Please comment on items placed in the N/A category OR items that were difficult to categorize.

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5. Obesity Prevention Strategies 4 of 4

Category Labels:

MICRO- (Interpersonal)= Interpersonal processes and primary groups that provide social identity and role definition (family, peers, associations).

MESO- (Organizational / Institutional) = Rules, regulations, policies, and informal structures (schools, religious groups).

EXO- (Community) = Social networks, norms, standards or other existing channels (e.g., public agenda, media agenda).

MACRO- (Social Structure/Policy) = Local, state, or federal polices and laws that regulate or support healthy actions.

1. Please continue to evaluate the items below and place them within one of the four categories.

	Interpersonal	Organizational/ Institutional	Community	Social Structure / Policy	N/A
63 Lectures on prevention of obesity by trained instructors delivered to parent groups	○	○	○	○	○
64 Community subsidizes local growers by purchasing local foods for school lunch program	○	○	○	○	○
65 Encourage parents to model active lifestyles.	○	○	○	○	○
66 Daily physical education required as a part of school curriculum for all children	○	○	○	○	○
67 Health and wellness components become embedded in all educational settings	○	○	○	○	○
68 Reduce children's exposure to smoke at home.	○	○	○	○	○
69 Increase zoning and planning for parks and recreation areas	○	○	○	○	○
70 Neighboring community physical activity monthly challenges	○	○	○	○	○
71 Computerized obesity tracking program managed by pediatricians	○	○	○	○	○
72 Develop community-based obesity surveillance division to track and communicate trends of obesity in community.	○	○	○	○	○
73 Provide health insurance coverage for health services to improve nutrition and prevent obesity	○	○	○	○	○
74 School and education agencies sponsor activity-based fundraisers.	○	○	○	○	○
75 Provide obesity prevention audiovisual resources for parents.	○	○	○	○	○
76 Development of new community walking trails	○	○	○	○	○
77 Promotion to eat healthy delivered by posters in strategic places around community	○	○	○	○	○
78 Increase the number of primary care physicians who address, diagnose, and prescribe treatment for obese children.	○	○	○	○	○
79 Child counseling on prevention of obesity by trained instructors	○	○	○	○	○
80 School-based program designed to reduce television viewing	○	○	○	○	○

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01 Establish collaborative relationships between government and schools to enhance school-based health education programs

Please comment on items placed in the N/A category OR items that were difficult to categorize.

2. Overall Comments or Suggestions for Item Improvement

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6. Thank You

Thank you for your assistance.

If you have additional questions or comments please feel free to contact me via email: ejones@uga.edu or by phone: 706-542-4210.

I greatly appreciate your time and expertise.
Thank you.

Emily Jones
Dr. Paul G Schempp

APPENDIX M

PILOT STUDY A SECTION 1 DESCRIPTIVE STATISTICS

	M	Mode	Range
Category 1 *Extremely Support Obesity Prevention* (4 items)			
1. There is no greater social issue that needs immediate attention than childhood obesity prevention.	1	1	0
2. In my opinion, cost should be a non-issue when designing childhood obesity prevention programs.	1	1	0
8. I would gladly embrace childhood obesity prevention programs if implemented in my community.	1.85	2	1
15. If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.	2	2	2
Category 2 (4 items)			
14. There are few social issues that are more important than childhood obesity prevention.	1.57	2	1
7. Greater social action must be taken now to reduce and prevent childhood obesity.	1.85	2	1
25. I would support childhood obesity prevention programs with my tax dollars.	1.57	1	2
24. Pro-active obesity prevention strategies will enhance the health of young people.	2	2	0
Category 3 (4 items)			
13. Childhood obesity requires preventative action.	2.57	3	1
16. I know obesity affects the health of many young people, so I believe preventative action is needed.	2.57	3	1
3. Current spending on childhood obesity prevention is insufficient.	2.42	2	1
18. Treatment of diagnosed obesity in children will save time and money.	3	2	4
Category 4 *Neutral* (4 items)			
17. I do not know enough about childhood obesity to know if preventative action is necessary.	4.28	4	2
31. If childhood obesity were such a problem, more prevention programs would already be in place.	5.85	6	2
6. I do not know how much money is spent on childhood obesity prevention.	4	4	0
5. I rarely think about childhood obesity prevention, it is a non-issue to me	4.85	4	3
Category 5 (4 items)			

9. Current spending on childhood obesity is sufficient.	5	5	2
19. There are more important social issues that deserve attention before childhood obesity prevention.	5.57	5	2
26. Obesity prevention is a personal issue and should not be a social agenda.	5.28	6	5
29. Treatment of childhood obesity is more pragmatic than prevention.	5	5	2
Category 6 (4 items)			
20. Too much government money is already spent on preventing childhood obesity.	6.14	6	2
10. My children are not obese, so I should not have to pay for others who are.	6.14	6	1
28. Trying to prevent childhood obesity would be a complete waste of time.	6.28	7	5
12. Energy spent on preventing childhood obesity could be used in more productive ways.	6.14	6	3
Category 7 *Extremely Opposed to Obesity Prevention* (4 items)			
11. I would not support childhood obesity prevention programs if implemented in my community.	5.57	6	4
23. No social action should be taken to prevent childhood obesity.	6.85	7	1
4. No federal or state money should be spent on childhood obesity prevention.	6.14	6	2
30. Childhood obesity is not preventable.	6.14	6	2

APPENDIX N

PILOT STUDY A SECTION 1 ITEM MODIFICATIONS

Original	Modified to	Rationale
8. Long-term benefits of childhood obesity prevention will outweigh the costs.	8. I would gladly embrace childhood obesity prevention programs if implemented in my community.	Original phrasing was too fact feeling as though participant would have to know how the cost of obesity prevention
31. If childhood obesity were such a problem, more social programs would already be in place to confront the issue.	31. If childhood obesity were such a problem, more prevention programs would already be in place.	Greater specificity regarding type of programs
5. Childhood obesity prevention is a non-issue to me.	5. I rarely think about childhood obesity prevention, it is a non-issue to me.	Clarity of the statement is enhanced when the contextual statement was added.
11. Obesity prevention is a personal issue, not a social one.	11. I would not support childhood obesity prevention programs if implemented in my community.	Greater specificity and personal investment.
30. Childhood obesity is not preventable, so prevention efforts would be wasteful.	30. Childhood obesity is not preventable.	Simplified to eliminate the double-barreled item.

APPENDIX O

PILOT STUDY A SECTION 2 MEAN RANKINGS ANALYSIS

	Dimension (*M*)		
	Internality	Chance	Powerful Others
1. If a child is obese, it is a result of his/her own behaviors.	4.86	0.86	1.86
2. Parents should not be blamed for obesity in their children.	2.29	2.00	3.14
3. Someone or something is responsible for obesity in children, not luck.	2.14	2.00	3.00
4. Genetics is a primary cause of obesity in children.	1.00	3.43	2.00
5. If a child takes care of him/herself, they can avoid becoming obese.	3.71	1.14	2.00
6. I do not believe other people control the obesity within an individual.	2.86	1.86	1.29
7. Children are not in control of their weight.	2.86	1.86	2.29
8. School lunch officials influence obesity in children.	1.43	1.14	4.29
9. It is by chance that some children are obese.	1.14	4.86	1.14
10. If it is meant to be, my child will become obese.	1.14	4.71	2.00
11. A child's obesity is a result of decisions made by other people in their lives.	1.00	1.29	4.29
12. I think obesity in children is an issue of self-responsibility.	4.86	1.00	1.00
13. Pro-active strategies can reduce obesity in children.	2.14	0.71	2.57
14. Parents are responsible for the obesity of their children.	1.29	1.43	4.14
15. I do not believe children have control over their obesity.	2.14	3.00	3.00
16. An obese child is a result of his/her family's social economic status.	1.14	2.29	4.00
17. An obese child has the choice to become healthy.	4.29	1.00	1.57
18. I cannot believe that chance is the cause of obesity in children.	2.71	2.14	2.71
19. Fast food restaurants are responsible for childhood obesity.	2.00	1.14	4.43
20. The mass production of food in the U.S. is a primary cause of obesity in kids.	1.71	1.29	4.57
21. Parents lack of proper nutrition knowledge influences obesity in their children.	1.43	1.14	4.57
22. The main thing that affects a child's obesity is what they do.	4.57	1.00	1.86
23. When a child is obese, he/she is to blame.	5.00	1.00	1.00
24. No one is to blame when a child is obese.	1.00	4.71	1.00
25. A child's family has a lot to do with their becoming obese.	1.57	1.29	4.43
26. Television programs targeted at children contribute to obesity in kids.	2.14	1.00	4.14
27. If a child is obese, it is a result of his/her decisions.	4.86	1.14	1.29
28. A child cannot be to blame if he/she is obese.	2.29	2.43	2.43
29. No matter what obese children do, they will always be	1.00	3.57	1.43

obese.			
30. I believe children have control over their obesity.	4.57	1.14	1.43
31. Children are in control of their own weight.	4.71	1.14	1.43
32. Luck plays a big part in determining who will become obese.	1.14	4.57	1.14
33. It is no one's fault that children are obese.	1.29	4.29	1.29
34. A child's behaviors are not the reason for their obesity.	2.14	2.43	2.00
35. The federal government is doing all it can to prevent obesity in children.	2.00	1.52	3.28
36. Luck has nothing to do with determining who will become obese.	2.43	2.14	2.57

APPENDIX P

PILOT STUDY A SECTION 2 CHOICE ITEMS

Internality (11 items)

1. If a child is obese, it is a result of his/her own behaviors.
5. If a child takes care of him/herself
15. I do not believe children have control over their obesity.
17. An obese child has the choice to become healthy.
22. The main thing that affects a child's obesity is what they do.
23. When a child is obese, he/she is to blame.
27. If a child is obese, it is a result of his/her decisions.
28. A child cannot be to blame if he/she is obese.
30. I believe children have control over their obesity.
31. Children are in control of their own weight.
34. A child's behaviors are not the reason for their obesity.

Chance Externality (11 items)

3. Someone or something is responsible for obesity in children, not luck.
4. Genetics is a primary cause of obesity in children.
9. It is by chance that some children are obese.
10. If it is meant to be, my child will become obese.
13. Pro-active strategies can reduce obesity in children.
18. I cannot believe that chance is the cause of obesity in children.
24. No one is to blame when a child is obese.
29. No matter what obese children do, they will always be obese.
32. Luck plays a big part in determining who will become obese.
33. It is no one's fault that children are obese.
36. Luck has nothing to do with determining who will become obese.

Powerful Others Externality (9 items)

8. School lunch officials influence obesity in children.
11. A child's obesity is a result of decisions made by other people in their lives.
14. Parents are responsible for the obesity of their children.
16. An obese child is a result of his/her family's social economic status.
19. Fast food restaurants are responsible for childhood obesity.
20. The mass production of food in the U.S. is a primary cause of obesity in kids.
21. Parents lack of proper nutrition knowledge influences obesity in their children.
25. A child's family has a lot to do with their becoming obese.
26. Television programs targeted at children contribute to obesity in kids.

APPENDIX Q

PILOT STUDY A SECTION 3 ITEM RE-CATEGORIZATION

Original category	Subject Matter Expert Category	Orig. #	CDC	Original item	% agreement of content exp.
INST	COMM	36	ENV	Community vendors and schools sponsor "Walk to School Day"	60
INST	INTP	41	PA	Provide families with households television time managing device	70
COMM	INST	53	PA	Free after-school structured physical activities for all children.	70
INST	COMM	54	ENV	School and local parks/recreation department collaborate to share facilities	70
SOC ST	INST	57	NW	Enforced restrictions on the availability of soft drinks in school vending machines	90
SOC ST	INST	67	EDU	Health and wellness components become embedded in all educational settings	70
INTP	INST	71	H	Computerized obesity tracking program managed by pediatricians	60
SOC ST	INST	76	ENV	Development of new community walking trails	80

APPENDIX R

PILOT STUDY B INFORMATION LETTER

Dear Parent,

You are invited to participate in a research project titled, *What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity*. Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear and representative survey instrument. Your participation will involve the completion of a paper/pencil working version of a survey that describes various obesity prevention strategies. You will also be asked to evaluate the content and clarity of the survey through a short written debriefing exercise following the completion of the survey. You will complete the survey during your regularly scheduled GPTA meeting or event and it will take approximately 10 minutes. The debriefing exercise at the completion of the survey will take approximately 5 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, there will no identifiable information collected during this project, so your identity and personal information will not be disclosed or associated with your responses on the survey.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By completing and returning this survey in the envelope provided, you are agreeing to participate in the above described research project.

Thank you for your time and consideration. Please keep a copy of this letter for your records.
Sincerely,
Emily M. Jones
ejones@uga.edu
Department of Kinesiology
University of Georgia 706-542-4210

APPENDIX S

PILOT STUDY B_1 INSTRUMENT

SECTION 2 cont.

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in one of the six selection choices.	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	DON'T KNOW
26	A child cannot be to blame if he/she is obese.						
27	No matter what obese children do, they will always be obese.						
28	I believe children have control over their obesity.						
29	Children are in control of their own weight.						
30	Luck plays a big part in determining who will become obese.						
31	It is no one's fault that children are obese.						
32	A child's behaviors are not the reason for their obesity.						
33	Luck has nothing to do with determining who will become obese.						

ADDITIONAL FEEDBACK

Were the directions of the survey you just completed clear? If not, please specify where by underlining the areas on the survey and provide rewording or clarification suggestions in the area below.

Please review the survey items and circle any words or phrases that you had to read multiple times to understand the meaning or what you were asked to do.

PARENTS PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

DEMOGRAPHIC INFORMATION

AGE: ❑ 20-30 ❑ 31-40 ❑ 41-50 ❑ 51-60 ❑ 60+

SEX: ❑ Male ❑ Female

RACE/ETHNICITY- choose one of the following categories you most identify with:
- ❑ White/Caucasian
- ❑ Black / African American
- ❑ Asian/Pacific Islander, Hawaiian
- ❑ American Indian, Alaskan Native/Aleut Eskimo
- ❑ Hispanic/ Latino(a)
- ❑ Bi-Racial/ Multi-Racial

MARTIAL STATUS: ❑ Married ❑ Divorced ❑ Single

EDUCATIONAL LEVEL: ❑ Less than high school ❑ High school or equivalent ❑ Some college ❑ College graduate ❑ Advanced Degree

ANNUAL INCOME: ❑ Less than $20,000 ❑ $21,000-$30,000 ❑ $31,000-$40,000 ❑ $41,000-$50,000 ❑ $51,000-$60,000 ❑ $61,000-$70,000 ❑ $71,000-$80,000 ❑ Greater than $90,000

DO YOU HAVE CHILDREN: ❑ Yes ❑ No

AGE(S) OF YOUR CHILDREN:_____

GRADE LEVEL OF YOUR CHILDREN: ❑ Elementary (K-5th) ❑ Middle School (6th-8th) ❑ High School(9th-12th)

RESIDENT COUNTY:_____

RESIDENT STATE:_____

Georgia PTA everychild.onevoice.® DEPARTMENT OF KINESIOLOGY THE UNIVERSITY OF GEORGIA

SECTION 1

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in the appropriate box.	DIS-AGREE	AGREE
1	There is no greater social issue that needs immediate attention than childhood obesity prevention.		
2	In my opinion, cost should be a non-issue when designing childhood obesity prevention programs.		
3	Current spending on childhood obesity prevention is insufficient.		
4	No federal or state money should be spent on childhood obesity prevention.		
5	I rarely think about childhood obesity prevention, it is a non-issue to me.		
6	I do not know how much money is spent on childhood obesity prevention.		
7	Greater social action must be taken now to reduce and prevent childhood obesity.		
8	I would gladly embrace childhood obesity prevention programs if implemented in my community.		
9	Current spending on childhood obesity is sufficient.		
10	My children are not obese, so I should not have to pay for others who are.		
11	I would not support childhood obesity prevention programs if implemented in my community.		
12	Energy spent on preventing childhood obesity could be used in more productive ways.		
13	Childhood obesity requires preventative action.		
14	There are few social issues that are more important than childhood obesity prevention.		
15	If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.		
16	I know obesity affects the health of many young people, so I believe preventative action is needed.		
17	I do not know enough about childhood obesity to know if preventative action is necessary.		
18	Treatment of diagnosed obesity in children will save time and money.		
19	There are more important social issues that deserve attention before childhood obesity prevention.		
20	Too much government money is already spent on preventing childhood obesity.		
21	No social action should be taken to prevent childhood obesity.		
22	Pro-active obesity prevention strategies will enhance the health of young people.		
23	I would support childhood obesity prevention programs with my tax dollars.		
24	Obesity prevention is a personal issue and should not be a social agenda.		
25	Trying to prevent childhood obesity would be a complete waste of time.		
26	Treatment of childhood obesity is more pragmatic than prevention.		
27	Childhood obesity is not preventable.		
28	If childhood obesity were such a problem, more prevention programs would already be in place.		

SECTION 2

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in one of the six selection choices.	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	DON'T KNOW
1	If a child is obese, it is a result of his/her own behaviors.						
2	Parents should not be blamed for obesity in their children.						
3	Someone or something is responsible for obesity in children, not luck.						
4	Genetics is a primary cause of obesity in children.						
5	If a child takes care of him/herself, they can avoid becoming obese.						
6	I don't believe other people control the obesity of children.						
7	School lunch officials influence obesity in children.						
8	It is by chance that some children are obese.						
9	If it is meant to be, my child will become obese.						
10	A child's obesity is a result of decisions made by other people in their lives.						
11	Pro-active strategies can reduce obesity in children.						
12	Parents are responsible for the obesity of their children.						
13	I do not believe children have control over their obesity.						
14	An obese child is a result of his/her family's social economic status.						
15	An obese child has the choice to become healthy.						
16	I cannot believe that chance is the cause of obesity in children.						
17	Fast food restaurants are responsible for childhood obesity.						
18	The mass production of food in the U.S. is a primary cause of obesity in kids.						
19	Parents lack of proper nutrition knowledge influences obesity in their children.						
20	The main thing that affects a child's obesity is what they do.						
21	When a child is obese, he/she is to blame						
22	No one is to blame when a child is obese.						
23	A child's family has a lot to do with their becoming obese.						
24	Television programs targeted at children contribute to obesity in kids.						
25	If a child is obese, it is a result of his/her decisions.						

OVER PLEASE >

APPENDIX T

PILOT STUDY B_1 SECTION 1 ITEM AGREEMENT

Table 6.1

Percentage of Pilot B_1Participant Agreement Section 1 (n=33)

Rank	*Item*	*Item #*	*# Agree*	*N*	*% agree*
1	There is no greater social issue that needs immediate attention than childhood obesity prevention.	1	10	33	30.3%
1	In my opinion, cost should be a non-issue when designing childhood obesity prevention programs.	2	17	33	51.5%
1	Greater social action must be taken now to reduce and prevent childhood obesity.	7	32	33	97.0%
1	If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.	15	28	33	84.8%
2	There are few social issues that are more important than childhood obesity prevention.	14	14	33	42.4%
2	Treatment of diagnosed obesity in children will save time and money.	18	27	33	81.8%
2	Pro-active obesity prevention strategies will enhance the health of young people.	22	33	33	100.0%
2	I would support childhood obesity prevention programs with my tax dollars.	23	27	33	81.8%
3	Current spending on childhood obesity prevention is insufficient.	3	26	33	78.8%
3	I would gladly embrace childhood obesity prevention programs if implemented in my community.	8	32	33	97.0%
3	Childhood obesity requires preventative action.	13	33	33	100.0%
3	I know obesity affects the health of many young people, so I believe preventative action is needed.	16	33	33	100.0%
4	I rarely think about childhood obesity prevention, it is a non-issue to me.	5	7	33	21.2%
4	I do not know how much money is spent on childhood obesity prevention.	6	31	33	93.9%
4	I do not know enough about childhood obesity to know if preventative action is necessary.	17	7	33	21.2%
4	If childhood obesity were such a problem, more prevention programs would already be in place.	28	1	33	3.0%
5	Current spending on childhood obesity is sufficient.	9	5	33	15.2%
5	My children are not obese, so I should not have to pay for others who are.	10	5	33	15.2%
5	I would not support childhood obesity prevention programs if implemented in my community.	11	3	33	9.1%
5	Energy spent on preventing childhood obesity could be used in more productive ways.	12	7	33	21.2%
6	There are more important social issues that deserve attention before childhood obesity prevention.	19	20	33	60.6%

6	Too much government money is already spent on preventing childhood obesity.	20	2	33	6.1%
6	Obesity prevention is a personal issue and should not be a social agenda.	24	5	33	15.2%
6	Treatment of childhood obesity is more pragmatic than prevention.	26	4	33	12.1%
7	No federal or state money should be spent on childhood obesity prevention.	4	1	33	3.0%
7	No social action should be taken to prevent childhood obesity.	21	2	33	6.1%
7	Trying to prevent childhood obesity would be a complete waste of time.	25	1	33	3.0%
7	Childhood obesity is not preventable.	27	1	33	3.0%

APPENDIX U

PILOT STUDY B_1 SECTION 2 TOTAL VARIANCE EXPLAINED 33 COMPONENTS

Table 6.2

Pilot B_2 Total Variance Explained Retaining 33 Components

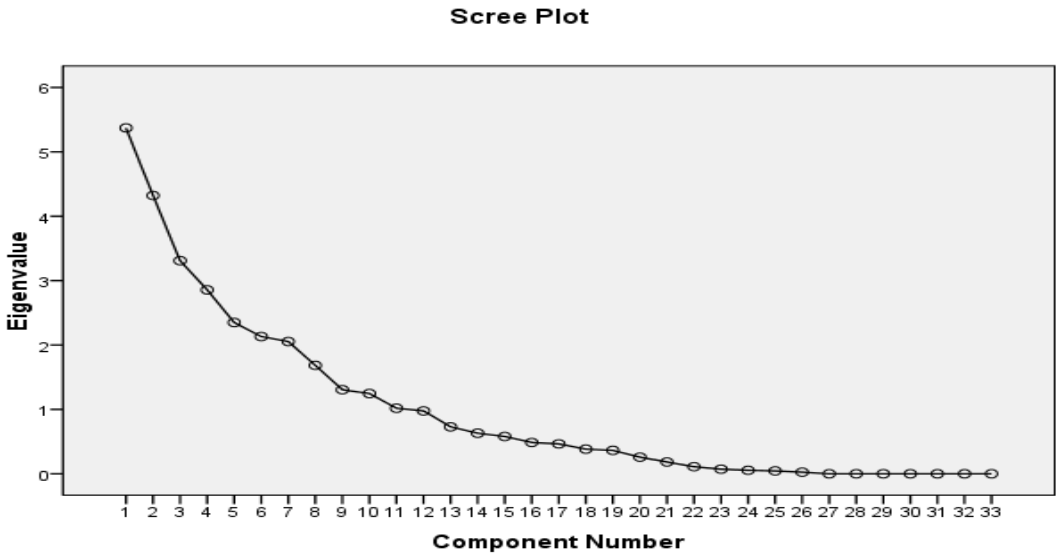
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.372	16.277	16.277	5.372	16.277	16.277
2	4.322	13.096	29.373	4.322	13.096	29.373
3	3.309	10.028	39.401	3.309	10.028	39.401
4	2.856	8.656	48.057	2.856	8.656	48.057
5	2.349	7.119	55.175	2.349	7.119	55.175
6	2.131	6.459	61.634	2.131	6.459	61.634
7	2.054	6.224	67.858	2.054	6.224	67.858
8	1.683	5.100	72.958	1.683	5.100	72.958
9	1.305	3.954	76.912	1.305	3.954	76.912
10	1.246	3.776	80.688	1.246	3.776	80.688
11	1.018	3.084	83.772	1.018	3.084	83.772
12	.976	2.958	86.730	.976	2.958	86.730
13	.729	2.209	88.938	.729	2.209	88.938
14	.630	1.909	90.847	.630	1.909	90.847
15	.579	1.754	92.601	.579	1.754	92.601
16	.486	1.473	94.074	.486	1.473	94.074
17	.464	1.406	95.481	.464	1.406	95.481
18	.382	1.159	96.640	.382	1.159	96.640
19	.364	1.102	97.742	.364	1.102	97.742
20	.258	.782	98.524	.258	.782	98.524
21	.183	.554	99.078	.183	.554	99.078
22	.109	.331	99.409	.109	.331	99.409
23	.071	.216	99.626	.071	.216	99.626
24	.054	.164	99.790	.054	.164	99.790

25	.045	.136	99.925	.045	.136	99.925
26	.025	.075	100.000	.025	.075	100.000
27	6.653E-16	2.016E-15	100.000	6.653E-16	2.016E-15	100.000
28	2.084E-16	6.315E-16	100.000	2.084E-16	6.315E-16	100.000
29	1.815E-17	5.501E-17	100.000	1.815E-17	5.501E-17	100.000
30	-3.027E-17	-9.174E-17	100.000	3.027E-17	9.174E-17	100.000
31	-9.865E-17	-2.989E-16	100.000	9.865E-17	2.989E-16	100.000
32	-3.056E-16	-9.260E-16	100.000	3.056E-16	9.260E-16	100.000
33	-4.831E-16	-1.464E-15	100.000	4.831E-16	1.464E-15	100.000

Extraction Method: Principal Component Analysis.

APPENDIX V

PILOT STUDY B_1 SCREE PLOT



APPENDIX W

PILOT STUDY B_1 SECTION 2 COMPONENT MATRIX 11 RETAINED

	Component										
Item/Variable	1	2	3	4	5	6	7	8	9	10	11
Percent Variance Explained (%)	***16.7***	***13.09***	***10.02***	***8.65***	***7.11***	***6.45***	***6.22***	***5.10***	***3.95***	***3.77***	***3.08***
1 If a child is obese, it is a result of his/her own behaviors.	.626		.468								
2 Parents should not be blamed for obesity in their children.	.557										
3 Someone or something is responsible for obesity in children, not luck.				.460	.565						
4 Genetics is a primary cause of obesity in children.	-.560				-.506						
5 If a child takes care of him/herself, they can avoid becoming obese.			.478					.411			
6 I do not believe other people control the obesity of children.		-.472				-.470					
7 School lunch officials influence obesity in children.	.508										
8 It is by chance that some children are obese.							.458				
9 If it is meant to be, my child will become obese.	-.547			.410		.434					
10 A child's obesity is a result of decisions made by other people in their lives.		.795									
11 Pro-active strategies can reduce obesity in children.			.417		-.454						
12 Parents are responsible for the obesity of their children.	.466				.414		.465				
13 I do not believe children have control over their obesity.	.653										
14 An obese child is a result of his/her family's social economic status.	-.488										
15 An obese child has	.458				-.492					.407	

the choice to become healthy.										
16 I cannot believe that chance is the cause of obesity in children.			.533					-.480		
17 Fast food restaurants are responsible for childhood obesity.		.753								
18 The mass production of food in the U.S. is a primary cause of obesity in kids.		.728								
19 Parents lack of proper nutrition knowledge influences obesity in their children.				.531			.508			
20 The main thing that affects a child's obesity is what they do.			.495	.476						
21 When a child is obese, he/she is to blame.		-.714								
22 No one is to blame when a child is obese.				.589	.441					
23 A child's family has a lot to do with their becoming obese.						-.480	.532			
24 Television programs targeted at children contribute to obesity in kids.	.483					-.448				
25 If a child is obese, it is a result of his/her decisions.		-.579								
26 A child cannot be to blame if he/she is obese.		-.455					-.437			
27 No matter what obese children do, they will always be obese.	-.569									
28 I believe children have control over their obesity.	.617			.428						
29 Children are in control of their own weight.	.534									
30 Luck plays a big part in determining who will become obese.			.529	-.404						
31 It is no one's fault that children are obese.			.567				-.417			

32 A child's behaviors are not the reason for their obesity.						.406	-.433			
33 Luck has nothing to do with determining who will become obese.	-.400		.462	-.540						
Extraction Method: Principal Component Analysis.										
a. 11 components extracted										

APPENDIX X

PILOT STUDY B_1 SECTION 2 VARIMAX ROTATION OF 11 COMPONENTS

Table 6.4

Varimax Rotation Component Matrix Pilot B_1

	Component										
	1	2	3	4	5	6	7	8	9	10	11
Percent variance explained	*10.5*	*10.3*	*8.9*	*8.6*	*7.7*	*7.4*	*6.8*	*6.5*	*6.0*	*5.7*	*4.8*
1 If a child is obese, it is a result of his/her own behaviors.		.744						.408			
2 Parents should not be blamed for obesity in their children.	.425				.459						
3 Someone or something is responsible for obesity in children, not luck.			.839								
4 Genetics is a primary cause of obesity in children.				.775							
5 If a child takes care of him/herself, they can avoid becoming obese.								.915			
6 I do not believe other people control the obesity of children.	-.700										
7 School lunch officials influence obesity in children.											-.558
8 It is by chance that some children are obese.				.707				-.412			
9 If it is meant to be, my child will become obese.				.789							
10 A child's obesity is a result of decisions made by other people in their lives.	.794										
11 Pro-active strategies can reduce obesity in children.									.802		
12 Parents are responsible for the obesity of their children.					.795						
13 I do not believe children have control over their obesity.							.482				
14 An obese child is a result of his/her family's social economic status.							-.591				
15 An obese child has the choice to become healthy.									.781		
16 I cannot believe that chance is the cause of obesity in children.				.415							
17 Fast food restaurants are	.877										

responsible for childhood obesity.										
18 The mass production of food in the U.S. is a primary cause of obesity in kids.	.725									
19 Parents lack of proper nutrition knowledge influences obesity in their children.						.857				
20 The main thing that affects a child's obesity is what they do.			.664							
21 When a child is obese, he/she is to blame.		.525							.493	
22 No one is to blame when a child is obese.			.889							
23 A child's family has a lot to do with their becoming obese.					.835					
24 Television programs targeted at children contribute to obesity in kids.				-.598	.408					
25 If a child is obese, it is a result of his/her decisions.									.842	
26 A child cannot be to blame if he/she is obese.		.466			-.531					
27 No matter what obese children do, they will always be obese.	-.443		.468							
28 I believe children have control over their obesity.		.774								
29 Children are in control of their own weight.		.840								
30 Luck plays a big part in determining who will become obese.						.863				
31 It is no one's fault that children are obese.						.502				-.466
32 A child's behaviors are not the reason for their obesity.		.436								.660
33 Luck has nothing to do with determining who will become obese.						.570	-.479			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 18 iterations.

APPENDIX Y

PILOT STUDY B_1 QUALITATIVE FEEDBACK

Debriefing Comments from Pilot Study B_1

"Remove "blame" from starred items" starred items were: Section 2: 2, 21, 22,26
Section 2: #18 "primary"
Section 1: #1 "no greater" was circled
Section 1:#3 "don't know what is being spent"
Section 1:#9 "don't know what is being spent and where"
Section 1:#18 "don't know"
Section 2: #10 depending on age"
"Luck = what? Luck in your parents? Lucky cultural background?"
Section 1: #3 "don't know what's spent"
Section 1: #5 "two different statements"

Debriefing Comments from Pilot Study B_1

Circled Words:	Underlined:
Section 1:	Section 1:
#1 no	
Section 2:	Section 2:
#4 genetics	#3 someone
#8 by chance	#3 something
# 32 behaviors	# 18 mass production of food
	#24 - eliminated "television programs" replace with 'commercials

APPENDIX Z

PILOT STUDY B_2 INSTRUMENT

JJ

0046

PARENTS PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

PPSCO

DEMOGRAPHIC INFORMATION

AGE: ☐ 20-30 ☑ 31-40 ☐ 41-50 ☐ 51-60 ☐ 60+

SEX: ☐ Male ☑ Female

RACE/ETHNICITY- choose one of the following categories you most identify with:

- ☐ White/Caucasian
- ☑ Black / African American
- ☐ Asian/Pacific Islander, Hawaiian
- ☐ American Indian, Alaskan Native/Aleut Eskimo
- ☐ Hispanic/ Latino(a)
- ☐ Bi-Racial/ Multi-Racial

MARTIAL STATUS: ☑ Married ☐ Divorced ☐ Single

EDUCATIONAL LEVEL: ☐ Less than high school ☐ High school or equivalent ☐ Some college ☐ College graduate ☑ Advanced Degree

ANNUAL INCOME: ☐ Less than $20,000 ☐ $21,000-$30,000 ☐ $31,000-$40,000 ☐ $41,000-$50,000 ☐ $51,000-$60,000 ☐ $61,000-$70,000 ☑ $71,000-$80,000 ☐ Greater than $80,000

DO YOU HAVE CHILDREN: ☑ Yes ☐ No

AGE(S) OF YOUR CHILDREN: 12, 7

GRADE LEVEL OF YOUR CHILDREN: ☑ Elementary (K-5th) ☑ Middle School (6th-8th) ☐ High School(9th-12th)

RESIDENT COUNTY: Rockdale

RESIDENT STATE: GA

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DEPARTMENT OF KINESIOLOGY THE UNIVERSITY OF GEORGIA

DIRECTIONS:

Please write a letter next to the four childhood obesity prevention strategies below to show your degree of support if they were to be implemented in your community. Use A for the strategy you would give greatest support, B next, then C, and D for the strategy you would least support.

1.
B Enhance PE classes with information about the outcomes associated with obesity
A Government enforced incentives for schools to enhance healthy environments
D Develop online parent forums about obesity prevention
C Community-sponsored health fairs

2.
B Increase physical activity opportunities for children within the structure of the regular school day
C Regularly offered parent-only physical activity awareness seminars
D Activity promotion delivered by Internet advertisements
A Local government and school collaboration to enhance school health education programs

3.
A Provide more parks and recreation supervised programs for children
B Hire additional school nurses to track obesity development in students
D Parents ensure children who have access to safe drinking water at home
C Improve air quality for children to play safely outdoors

4.
A Public programs and funds to improve walking and biking trails
D Schools open after hours for physical activity participation
B Parent reduction of the number of trips taken by car to increase outdoor air quality
C Develop a community-based obesity surveillance division to track and communicate trends of obesity in community

5.
C Computerized obesity tracking program managed by parents
A Reduce insurance premiums for healthy families
B Offer inexpensive community-wide programs promoting obesity prevention
D Computerized obesity tracking program managed by school nurses

6.
C Community-wide obesity risk assessment and screening
D Hospitals offer reduced price wellness classes to community youth
B Financial incentives for families choosing preventative medicine options
A Child counseling on prevention of obesity by trained instructors

7.
C Parental encouragement of fruit intake
D Legislation to enhance funding for research of obesity-related issues
A Modifications to school meals – reducing sodium, sugar, and fat content
B Increased media exposure of healthy food choices at the local level (i.e., posters around community)

8.
C Community subsidizes local growers by purchasing local foods for school lunch program
A Prohibit junk food or sugary sweets to be brought into school classrooms
D Increase tax on high fat foods
B Parents encourage the consumption of water

9.
B Increase number of parents engaging in physical activities with children
C Establish neighborhood "walking school bus" program (parent-led walking route to school)
A Require percentage of annual state revenue to be allocated for physical activity programs
D School-based program designed to reduce television viewing

10.
D Religious groups provide family focused exercise classes
A Increase the number of public parks and recreation areas
B Parental restrictions on child's television viewing time
C Public incentive programs for local business that promote physical activity

ADDITIONAL FEEDBACK

Please list any strategies that you did not see identified on the survey that you believe would be effective at reducing childhood obesity in your community.

Were the directions of the survey you just completed clear? If not, please specify where by underlining the areas on the survey and provide rewording or clarification suggestions in the area below.

YES except for #3 the third choice. I think who should be deleted

Please review the survey items and circle any words or phrases that you had to read multiple times to understand the meaning or what you were asked to do.

APPENDIX AA

PILOT STUDY B_2 DEBRIEFING COMMENTS

45	Low cost activities
50	Educating and staff of the importance of physical activity - "physical benefits and mental benefits"
53	Obese parents have obese children and it is extremely difficult to alter parents habits. Medicaid or other government funding should not support processed high fat foods
55	Parental education on snack and healthy eating
57	Daily PE classes required in the school program from the beginning of school year to the end
58	school bus 'walking' program.
	Improve school meals, reduce sodium, sugar, fats, etc
	Increase exercise choices at school
59	Have schools help pay for some of the costs to play after school sports (high school)
61	No sodas in schools. No junk food using welfare money
	Tax incentives for home gardens, water purifiers, air filters, home exercise equipment
	Nutrition information and ingredients listed on recipes for restaurants and fast foods
65	Don't serve high fat /sodium in school and educate why
66	Alter middle time in our county so school doesn't start at 9 and end at 4, preventing ample time for sports/homework, etc
	Better PE programs in schools- strolling the gym doesn't get it
	Allowing recess for students to run, jump play
	PE everyday in schools- not 203 day/s week
	Emphasis on decreasing screen time: TV, video, and computer
67	Recess should be mandatory at all levels of school every day
69	Awareness of public design in communities to incorporate walking paths
	Encourage use of school buses- children awareness and parents driving to school = increased pollution
75	School lunches must be the first line in changing unhealthy habits.
76	Pediatricians taking more time with parents- setting up with nutritionists
79	Restrict sodas and video games
84	Teach children early on the basic food pyramid and each year continue it so that they understand how it works.
86	Require middle schools to designate a recess of more PE time
90	house developments: teams (adult and youth), recreation areas (more than 1)
	"As a former teacher- I believe a lot has to be done at school because there is not a lot of interaction at home- with work and overwhelming activities life is too busy at home.
97	Children should be required to have 30 minutes of recess each day. My child's 3rd grade teacher routinely restricts PE time as punishment for even the most minor infractions.
102	pinpoint children who are already obese and work with them more thoroughly (extra

PE, nurse tracking, nutrition counseling)

103 work with teachers to talk with class consistently and often about food and snack choices and exercise

108 school fitness challenge

encourage recreational sports leagues

nutrition/dietician classes- cooking for prep classes for parents

110 I am against government involvement in personal lives.

APPENDIX BB

PILOT STUDY C INFORMATIONAL LETTER

Dear Parent,

You are invited to participate in a research project titled, *What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity*. Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear and representative survey instrument. Your participation will involve the completion of a paper/pencil or electronic survey that describes various obesity prevention strategies. You will complete the survey during your regularly scheduled GPTA meeting or event and it will take approximately 15 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, any individually identifiable information obtained during this project will be kept confidential; your identity and personal information will not be disclosed or associated with your responses on the survey. If you choose to complete the electronic survey, beware that Internet communications are insecure and there is a limit to the confidentiality that can be guaranteed due to the technology itself. However once the materials are received by the researcher, standard confidentiality procedures will be employed and any personal identifiable information will be removed and destroyed.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By completing and returning this survey in the envelope provided or navigating to https://www.surveymonkey.com/s.aspx?sm=emO8rWOFLi8HxVKhZggz7Q_3d_3d and completing the survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration. Please keep a copy of this letter for your records.
Sincerely,
Emily M. Jones
Department of Kinesiology University of Georgia 706-542-4210

APPENDIX CC

PILOT STUDY C INSTRUMENT PAPER PENCIL FORMAT

PARENTS PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

DEMOGRAPHIC INFORMATION

AGE: ☐ 20-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 60+

SEX: ☐ Male ☐ Female

RACE/ETHNICITY- choose one of the following categories you most identify with:

- ☐ White/Caucasian
- ☐ Black / African American
- ☐ Asian/Pacific Islander, Hawaiian
- ☐ American Indian, Alaskan Native/Aleut Eskimo
- ☐ Hispanic/ Latino(a)
- ☐ Bi-Racial/ Multi-Racial

MARTIAL STATUS: ☐ Married ☐ Divorced ☐ Single

EDUCATIONAL LEVEL: ☐ Less than high school ☐ High school or equivalent ☐ Some college ☐ College graduate ☐ Advanced Degree

ANNUAL INCOME: ☐ Less than $20,000 ☐ $21,000-$30,000 ☐ $31,000-$40,000 ☐ $41,000-$50,000 ☐ $51,000-$60,000 ☐ $61,000-$70,000 ☐ $71,000-$80,000 ☐ Greater than $90,000

DO YOU HAVE CHILDREN: ☐ Yes ☐ No

AGE(S) OF YOUR CHILDREN:_____

GRADE LEVEL OF YOUR CHILDREN: ☐ Elementary (K-5th) ☐ Middle School (6th-8th) ☐ High School(9th-12th)

RESIDENT COUNTY:_____

RESIDENT STATE:_____

Georgia PTA everychild. onevoice.

DEPARTMENT OF KINESIOLOGY THE UNIVERSITY OF GEORGIA

SECTION 1

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in the appropriate box.	DIS-AGREE	AGREE
1	There is no greater social issue that needs immediate attention than childhood obesity prevention.		
2	I rarely think about childhood obesity prevention, it is a non-issue to me.		
3	Greater social action must be taken now to reduce and prevent childhood obesity.		
4	I would gladly embrace childhood obesity prevention programs if implemented in my community.		
5	My children are not obese, so I should not have to pay for others who are.		
6	I would not support childhood obesity prevention programs if implemented in my community.		
7	Energy spent on preventing childhood obesity could be used in more productive ways.		
8	Childhood obesity requires preventative action.		
9	There are few social issues that are more important than childhood obesity prevention.		
10	If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.		
11	I know obesity affects the health of many young people, so I believe preventative action is needed.		
12	I do not know enough about childhood obesity to know if preventative action is necessary.		
13	Treatment of diagnosed obesity in children will save time and money.		
14	There are more important social issues that deserve attention before childhood obesity prevention.		
15	No social action should be taken to prevent childhood obesity.		
16	Pro-active obesity prevention strategies will enhance the health of young people.		
17	Obesity prevention is a personal issue and should not be a social agenda.		
18	Trying to prevent childhood obesity would be a complete waste of time.		
19	Treatment of childhood obesity is more pragmatic than prevention.		
20	Childhood obesity is not preventable.		
21	If childhood obesity were such a problem, more prevention programs would already be in place.		

SECTION 2

	DIRECTIONS: Please respond to each of the following statements by circling on one of the five selection choices.	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	If a child is obese, it is a result of his/her own behaviors.					
2	Parents should not be blamed for obesity in their children.					
3	Someone or something is responsible for obesity in children, not luck.					
4	Genetics is a primary cause of obesity in children.					
5	I don't believe other people control the obesity of children.					
6	It is by chance that some children are obese.					
7	If it is meant to be, my child will become obese.					
8	A child's obesity is a result of decisions made by other people in their lives.					
9	Parents are responsible for the obesity of their children.					
10	I cannot believe that chance is the cause of obesity in children.					
11	Fast food restaurants are responsible for childhood obesity.					
12	The mass production of food in the U.S. is a primary cause of obesity in kids.					
13	The main thing that affects a child's obesity is what they do.					
14	When a child is obese, he/she is to blame					
15	No one is to blame when a child is obese.					
16	A child's family has a lot to do with their becoming obese.					
17	Television programs targeted at children contribute to obesity in kids.					
18	A child cannot be to blame if he/she is obese.					
19	No matter what obese children do, they will always be obese.					
20	I believe children have control over their obesity.					
21	Children are in control of their own weight.					
22	A child's behaviors are not the reason for their obesity.					

SECTION 3

DIRECTIONS:
Please write a letter next to the four childhood obesity prevention strategies below to show your degree of support if they were to be implemented in your community. Use A for the strategy you would give greatest support, B next, then C, and D for the strategy you would least support.

1.
_____Enhance PE classes with information about the outcomes associated with obesity
_____Government sponsored incentives for schools to enhance healthy environments
_____Develop online parent forums about obesity prevention
_____Community-sponsored health fairs

2.
_____Increase physical activity opportunities for children within the structure of the regular school day
_____Regularly offered parent-only physical activity awareness seminars
_____Activity promotion delivered by Internet advertisements
_____Local government and school collaboration to enhance school health education programs

3.
_____Provide more parks and recreation supervised programs for children
_____Hire additional school nurses to track obesity development in students
_____Parents must ensure children have access to safe drinking water at home
_____Improve air quality for children to play safely outdoors

4.
_____Public programs and funds to improve walking and biking trails
_____Schools open after hours for physical activity participation
_____Parent reduction of the number of trips taken by car to increase outdoor air quality
_____Develop a community-based obesity surveillance division to track and communicate trends of obesity in community

5.
_____Computerized obesity tracking program managed by parents
_____Reduce insurance premiums for healthy families
_____Offer inexpensive community-wide programs promoting obesity prevention
_____Computerized obesity tracking program managed by school nurses

6.
_____Community-wide obesity risk assessment and screening
_____Hospitals offer reduced price wellness classes to community youth
_____Financial incentives for families choosing preventative medicine options
_____Child counseling on prevention of obesity by trained instructors

7.
_____Parental encouragement of fruit intake
_____Legislation to enhance funding for research of obesity-related issues
_____Modifications to school meals – reducing sodium, sugar, and fat content
_____Increased media exposure of healthy food choices at the local level (i.e., posters around community)

8.
_____Community subsidizes local growers by purchasing local foods for school lunch program
_____Prohibit junk food or sugary sweets to be brought into school classrooms
_____Increase tax on high fat foods
_____Parents encourage the consumption of water

9.
_____Increase number of parents engaging in physical activities with children
_____Establish neighborhood "walking school bus" program (parent-led walking route to school)
_____Require percentage of annual state revenue to be allocated for physical activity programs
_____School-based program designed to reduce television viewing

10.
_____Religious groups provide family focused exercise classes
_____Increase the number of public parks and recreation areas
_____Parental restrictions on child's television viewing time
_____Public incentive programs for local business that promote physical activity

ADDITIONAL FEEDBACK

Please list any strategies that you did not see identified on the survey that you believe would be effective at reducing childhood obesity in your community.

Were the directions of the survey you just completed clear? If not, please specify where by underlining the areas on the survey and provide rewording or clarification suggestions in the area below.

Please review the survey items and circle any words or phrases that you had to read multiple times to understand the meaning or what you were asked to do.

Georgia PTA
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DEPARTMENT OF KINESIOLOGY
THE UNIVERSITY OF GEORGIA

APPENDIX DD

PILOT STUDY C INSTRUMENT ELECTRONIC FORMAT

1. Welcome and Survey Introduction

Dear Parent,

You are invited to participate in a research project titled, "What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity."

Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear survey instrument. Your participation will involve the completion of this electronic survey that describes various obesity prevention strategies. You will complete the survey at your leisure and it will take approximately 10 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, there will no identifiable information collected during this project, so your identity and personal information will not be disclosed or associated with your responses on the survey.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me (ejones@uga.edu) or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By proceeding to complete this survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

2. Parent Attitude Toward Obesity Prevention

Directions: Please respond to each of the following statements by placing a check mark in the appropriate box.

	Disagree	Agree
1.There is no greater social issue that needs immediate attention than childhood obesity prevention.	○	○
2. I rarely think about childhood obesity prevention, it is a non-issue to me.	○	○
3. Greater social action must be taken now to reduce and prevent childhood obesity.	○	○
4. I would gladly embrace childhood obesity prevention programs if implemented in my community.	○	○
5. My children are not obese, so I should not have to pay for others who are.	○	○
6. I would not support childhood obesity prevention programs if implemented in my community.	○	○
7. Resources spent on preventing childhood obesity could be used in more productive ways.	○	○
8. Childhood obesity requires preventative action.	○	○
9. There are few social issues that are more important than childhood obesity prevention.	○	○
10. If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.	○	○
11. I know obesity affects the health of many young people, so I believe preventative action is needed.	○	○
12. I do not know enough about childhood obesity to know if preventative action is necessary.	○	○
13. Treatment of diagnosed obesity in children will save time and money.	○	○
14. There are more important social issues that deserve attention before childhood obesity prevention.	○	○
15. No social action should be taken to prevent childhood obesity.	○	○
16. Pro-active obesity prevention strategies will enhance the health of young people.	○	○
17. Obesity prevention is a personal issue and should not be a social agenda.	○	○
18. Trying to prevent childhood obesity would be a complete waste of time.	○	○
19. Treatment of childhood obesity is more practical than trying to prevent obesity.	○	○
20. Childhood obesity is not preventable.	○	○
21. If childhood obesity were such a problem, more prevention programs would already be in place.	○	○

3. Parent Locus of Control of Childhood Obesity

Directions: Please respond to each of the following statements by placing a check mark in one of the five selection choices.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. If a child is obese, it is a result of his/her own behaviors.	○	○	○	○	○
2. Parents should not be blamed for obesity in their children.	○	○	○	○	○
3. Someone or something is responsible for obesity in children, not luck.	○	○	○	○	○
4. Genetics is a primary cause of obesity in children.	○	○	○	○	○
5. I don't believe other people control the obesity of children.	○	○	○	○	○
6. It is by chance that some children are obese.	○	○	○	○	○
7. If it is meant to be, my child will become obese.	○	○	○	○	○
8. A child's obesity is a result of decisions made by other people in their lives.	○	○	○	○	○
9. Parents are responsible for the obesity of their children.	○	○	○	○	○
10. I cannot believe that chance is the cause of obesity in children.	○	○	○	○	○
11. Fast food restaurants are responsible for childhood obesity.	○	○	○	○	○
12.The mass production of food in the U.S. is a primary cause of obesity in kids.	○	○	○	○	○
13. The main thing that affects a child's obesity is what they do.	○	○	○	○	○
14. When a child is obese, he/she is to blame	○	○	○	○	○
15. No one is to blame when a child is obese.	○	○	○	○	○
16. A child's family has a lot to do with their becoming obese.	○	○	○	○	○
17. Television programs targeted at children contribute to obesity in kids.	○	○	○	○	○
18. A child cannot be blamed if he/she is obese.	○	○	○	○	○
19. No matter what obese children do, they will always be obese.	○	○	○	○	○
20. I believe children have control over their obesity.	○	○	○	○	○
21. Children are in control of their own weight.	○	○	○	○	○
22. A child's behaviors are not the reason for their obesity.	○	○	○	○	○

4. Rank Ordered Support of Potential Solutions to Childhood Obesity

Directions: For each group listed below, please rank the four childhood obesity prevention strategies based upon which you would most prefer/support if implemented in your community.

1

	1st Choice	2nd Choice	3rd Choice	4th Choice
Enhance PE classes with information about the outcomes associated with obesity	○	○	○	○
Government sponsored incentives for schools to enhance healthy environments	○	○	○	○
Develop online parent forums about obesity prevention	○	○	○	○
Community-sponsored health fairs	○	○	○	○

2

	1st Choice	2nd Choice	3rd Choice	4th Choice
Increase physical activity opportunities for children within the structure of the regular school day	○	○	○	○
Regularly offered parent-only physical activity awareness seminars	○	○	○	○
Activity promotion delivered by internet advertisements	○	○	○	○
Local government and school collaboration to enhance school health education programs	○	○	○	○

3

	1st Choice	2nd Choice	3rd Choice	4th Choice
Provide more parks and recreation supervised programs for children	○	○	○	○
Hire additional school nurses to track obesity development in students	○	○	○	○
Parents must ensure children have access to safe drinking water at home	○	○	○	○
Improve air quality for children to play safely outdoors	○	○	○	○

4

	1st Choice	2nd Choice	3rd Choice	4th Choice
Public programs and funds to improve walking and biking trails	○	○	○	○
Schools open after hours for physical activity participation	○	○	○	○
Parent reduction of the number of trips taken by car to increase outdoor air quality	○	○	○	○
Develop a community-based obesity surveillance division to track and communicate trends of obesity in community	○	○	○	○

5

	1st Choice	2nd Choice	3rd Choice	4th Choice
Computerized obesity tracking program managed by parents	○	○	○	○
Reduce insurance premiums for healthy families	○	○	○	○
Offer inexpensive community-wide programs promoting obesity prevention	○	○	○	○
Computerized obesity tracking program managed by school nurses	○	○	○	○

6

	1st Choice	2nd Choice	3rd Choice	4th Choice
Community-wide obesity risk assessment and screening	○	○	○	○
Hospitals offer reduced price wellness classes to community youth	○	○	○	○
Financial incentives for families choosing preventative medicine options	○	○	○	○
Child counseling on prevention of obesity by trained instructors	○	○	○	○

7

	1st Choice	2nd Choice	3rd Choice	4th Choice
Parental encouragement of fruit intake	○	○	○	○
Enhanced legislative funding of obesity-related nutrition programs and research	○	○	○	○
Modifications to school meals – reducing sodium, sugar, and fat content	○	○	○	○
Increased media exposure of healthy food choices at the local level (i.e., posters around community)	○	○	○	○

8

	1st Choice	2nd Choice	3rd Choice	4th Choice
Community subsidizes local growers by purchasing local foods for school lunch program	○	○	○	○
Prohibit junk food or sugary sweets to be brought into school classrooms	○	○	○	○
Increase tax on high fat foods	○	○	○	○
Parents encourage the consumption of water	○	○	○	○

9

	1st Choice	2nd Choice	3rd Choice	4th Choice
Increase the number of parents engaging in physical activities with children	○	○	○	○
Establish neighborhood "walking school bus" program (parent-led walking route to school)	○	○	○	○
Require percentage of annual state revenue to be allocated for physical activity programs	○	○	○	○
School-based program designed to reduce television viewing	○	○	○	○

10

	1st Choice	2nd Choice	3rd Choice	4th Choice
Religious groups provide family focused exercise classes	○	○	○	○
Increase the number of public parks and recreation areas	○	○	○	○
Parental restrictions on child's television viewing time	○	○	○	○
Public incentive programs for local business that promote physical activity	○	○	○	○

5. Demographics

Demographic Information

Age

◯ 20-30 ◯ 31-40 ◯ 41-50 ◯ 51-60 ◯ 60+

Sex

◯ Male ◯ Female

Race/Ethnicity- choose one of the following categories you most identify with

◯ White/ Caucasian
◯ Black/ African American
◯ Asian/ Pacific Islander, Hawaiian
◯ American Indian, Alaskan Native/ Aluet Eskimo
◯ Hispanic/ Latino(a)
◯ Bi-Racial/ Multi-Racial

Marital Status

◯ Married ◯ Divorced ◯ Single

Educational Level

◯ Less than High School
◯ High School or Equivalent
◯ Some College
◯ College Graduate
◯ Advanced Degree

Annual Income (family)

◯ Less than $20,000 ◯ $41,000- $50,000 ◯ $71,000- $80,000
◯ $21,000- $30,000 ◯ $51,000- $60,000 ◯ $81,000- $90,000
◯ $31,000- $40,000 ◯ $61,000- $70,000 ◯ Greater than $90,000

Do you have children?

◯ Yes ◯ No

Age(s) of your children

_____

Grade level of your children (please check all that apply)

☐ Pre-K
☐ Elementary (K-5th)
☐ Middle School (6th-8th)
☐ High School (9th-12th)
☐ College

This data will only be used for analysis.

ZIP/Postal Code:

6. Thank you and Conclusion

Thank you for your assistance. Your time is greatly appreciated.

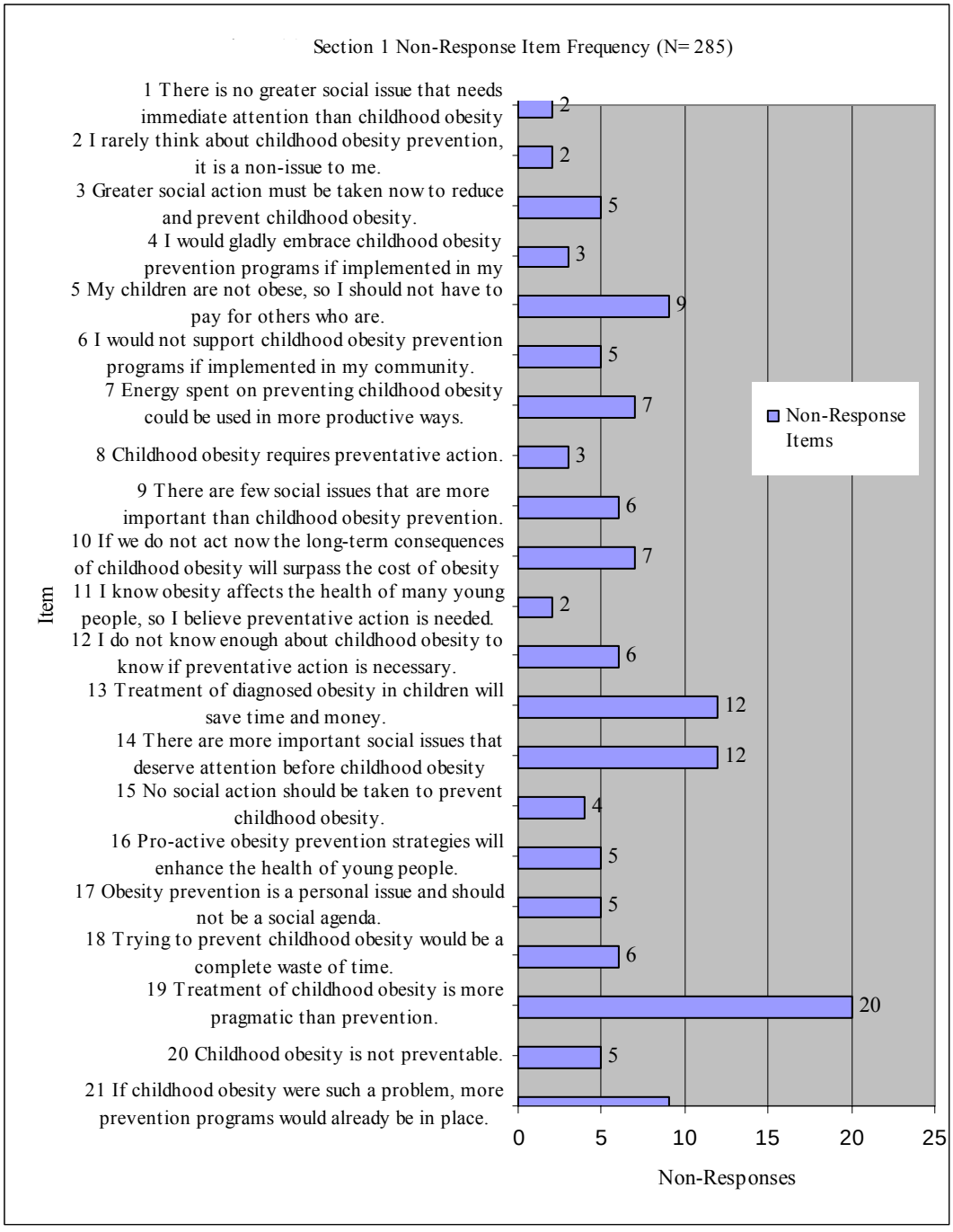
If you have additional questions or comments please feel free to contact me via email: ejones@uga.edu or by phone: 706-542-4210.

Thank you.

Emily Jones
Dr. Paul G Schempp

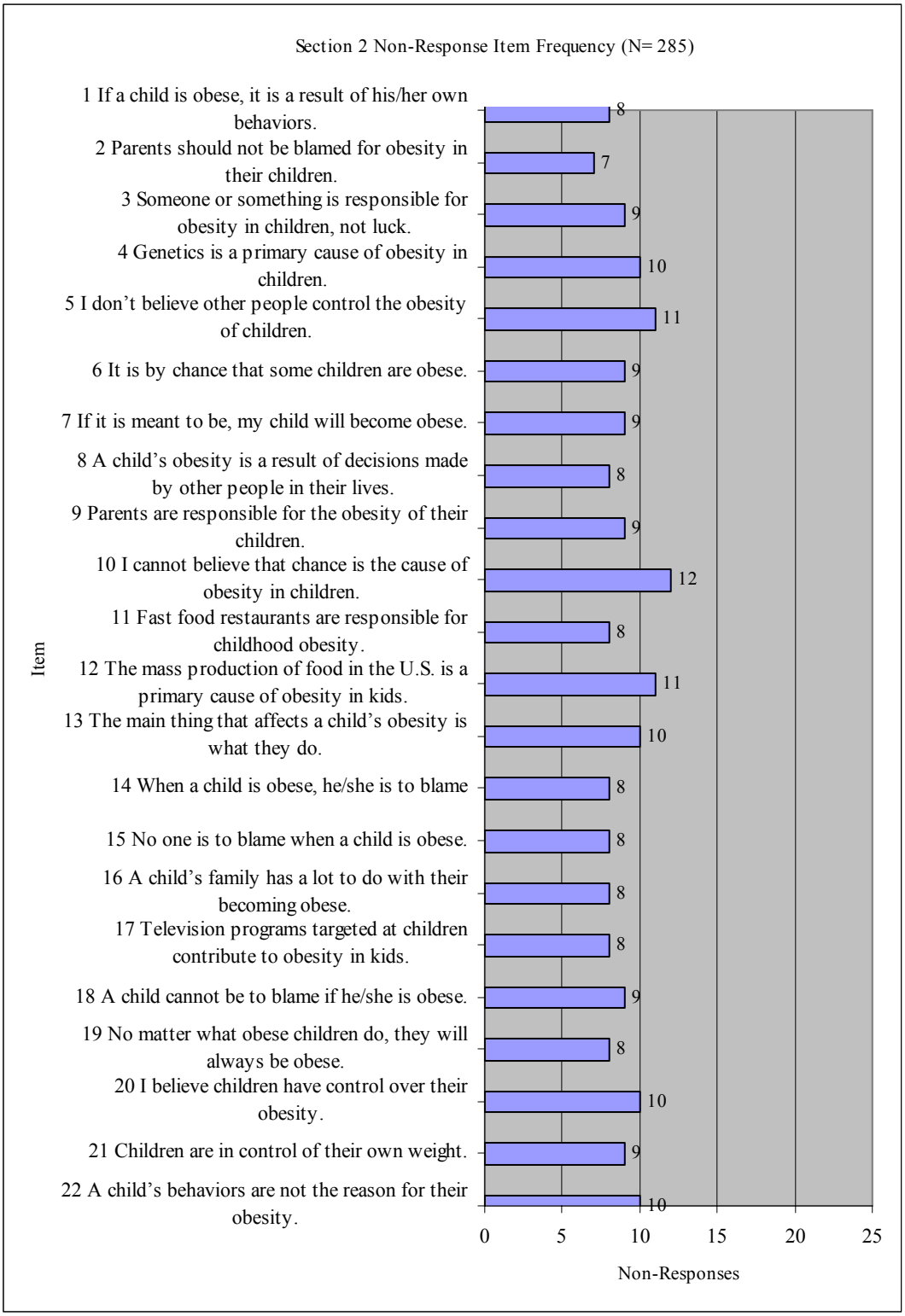
APPENDIX EE

PILOT STUDY C SECTION 1 NON RESPONSE DATA



APPENDIX FF

PILOT STUDY C SECTION 2 NON RESPONSE DATA



APPENDIX GG

PILOT STUDY C SECTION 1 PERCENT AGREEMENT

Rank	Item	Item#	# Agree	*N*	% of agreement
1	There is no greater social issue that needs immediate attention than childhood obesity prevention.	1	84	241	34.02%
1	Greater social action must be taken now to reduce and prevent childhood obesity.	3	211	241	87.55%
1	If we do not act now the long-term consequences of childhood obesity will surpass the cost of obesity prevention.	10	211	241	87.55%
2	There are few social issues that are more important than childhood obesity prevention.	9	131	241	54.35%
2	Treatment of diagnosed obesity in children will save time and money.	13	210	241	87.13%
2	Pro-active obesity prevention strategies will enhance the health of young people.	16	218	241	90.45%
3	I would gladly embrace childhood obesity prevention programs if implemented in my community.	4	205	241	85.06%
3	Childhood obesity requires preventative action.	8	211	241	87.55%
3	I know obesity affects the health of many young people, so I believe preventative action is needed.	11	217	241	90.04%
4	I rarely think about childhood obesity prevention, it is a non-issue to me.	2	32	241	13.27%
4	I do not know enough about childhood obesity to know if preventative action is necessary.	12	35	241	14.52%
4	If childhood obesity were such a problem, more prevention programs would already be in place.	21	15	241	6.22%
5	My children are not obese, so I should not have to pay for others who are.	5	52	241	21.57%
5	I would not support childhood obesity prevention programs if implemented in my community.	6	11	241	4.56%
5	Energy spent on preventing childhood obesity could be used in more productive ways.	7	56	241	23.23%
6	There are more important social issues that deserve attention before childhood obesity prevention.	14	69	241	28.63%
6	Obesity prevention is a personal issue and should not be a social agenda.	17	27	241	11.20%
6	Treatment of childhood obesity is more pragmatic than prevention.	19	34	241	14.10%
7	No social action should be taken to prevent childhood obesity.	15	10	241	4.14%
7	Trying to prevent childhood obesity would be a complete waste of time.	18	5	241	2.07%
7	Childhood obesity is not preventable.	20	5	241	2.07%

APPENDIX HH

PILOT STUDY C KMO & BARTLETT'S TEST DATA

Pilot C KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.744
Bartlett's Test of Sphericity	Approx. Chi-Square	1439.472
	df	231.000
	Sig.	.000

APPENDIX II

PILOT STUDY C SECTION 2 ITEM CORRELATIONS

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1																					
2																					
3																					
4																					
5																					
6																					
7						.505															
8																					
9		.428						.574													
10																					
11													.703								
12																					
13																					
14	.520																				
15																					
16									.503												
17																					
18																					
19							.440														
20																					.581
21																					

APPENDIX JJ

PILOT STUDY C SECTION 2 TOTAL VARIANCE EXPLAINED

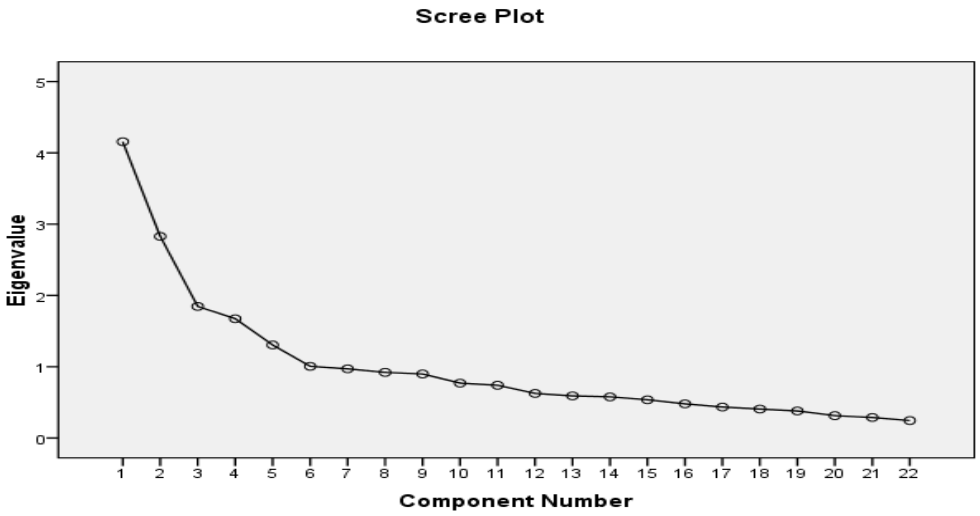
Pilot Study C Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.156	18.893	18.893	4.156	18.893	18.893
2	2.828	12.855	31.748	2.828	12.855	31.748
3	1.846	8.392	40.140	1.846	8.392	40.140
4	1.674	7.609	47.749	1.674	7.609	47.749
5	1.305	5.934	53.682	1.305	5.934	53.682
6	1.006	4.573	58.255	1.006	4.573	58.255
7	.971	4.414	62.669	.971	4.414	62.669
8	.921	4.186	66.855	.921	4.186	66.855
9	.899	4.086	70.941	.899	4.086	70.941
10	.770	3.500	74.441	.770	3.500	74.441
11	.741	3.367	77.808	.741	3.367	77.808
12	.626	2.847	80.656	.626	2.847	80.656
13	.591	2.688	83.344	.591	2.688	83.344
14	.578	2.626	85.970	.578	2.626	85.970
15	.537	2.441	88.411	.537	2.441	88.411
16	.480	2.182	90.593	.480	2.182	90.593
17	.435	1.976	92.569	.435	1.976	92.569
18	.407	1.850	94.419	.407	1.850	94.419
19	.380	1.728	96.147	.380	1.728	96.147
20	.314	1.427	97.574	.314	1.427	97.574
21	.288	1.311	98.885	.288	1.311	98.885
22	.245	1.115	100.000	.245	1.115	100.000

Extraction Method: Principal Component Analysis.

APPENDIX KK

PILOT STUDY C SECTION 2 SCREE PLOT



APPENDIX LL

PILOT STUDY C SECTION 2 UN-ROTATED COMPONENT MATRIX

Un-rotated Component Matrix , item, loading on five retained components, percent of explained variance

Item	Component				
	1	2	3	4	5
Percent variance explained (%)	*18.89*	*12.85*	*8.39*	*7.60*	*5.93*
1 If a child is obese, it is a result of his/her own behaviors.		.625			
2 Parents should not be blamed for obesity in their children.	.519				
3 Someone or something is responsible for obesity in children, not luck.	-.637				
4 Genetics is a primary cause of obesity in children.					-.530
5 I don't believe other people control the obesity of children.	.430				.423
6 It is by chance that some children are obese.	-.502				
7 If it is meant to be, my child will become obese.	-.484			.472	
8 A child's obesity is a result of decisions made by other people in their lives.	.481			.554	
9 Parents are responsible for the obesity of their children.	.750				
10 I cannot believe that chance is the cause of obesity in children.	-.490				
11 Fast food restaurants are responsible for childhood obesity.			.715		
12 The mass production of food in the U.S. is a primary cause of obesity in kids.			.751		
13 The main thing that affects a child's obesity is what they do.		.434			
14 When a child is obese, he/she is to blame		.674			
15 No one is to blame when a child is obese.	-.488				
16 A child's family has a lot to do with their becoming obese.	.615				
17 Television programs targeted at children contribute to obesity in kids.			.584		
18 A child cannot be to blame if he/she is obese.		.548			.464
19 No matter what obese children do, they will always be obese.	-.407			.469	
20 I believe children have control over their obesity.		.550			
21 Children are in control of their own weight.		.678			
22 A child's behaviors are not the reason for their obesity.	.445				

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

APPENDIX MM

PILOT STUDY C SECTION 2 ROTATED COMPONENT MATRIX

Varimax Rotation Component Matrix, item, loading on five components, percent variance explained

	Component				
Item	1	2	3	4	5
Percent variance explained (%)	*13.34*	*11.71*	*11.51*	*9.35*	*7.75*
1 If a child is obese, it is a result of his/her own behaviors.	.701				
2 Parents should not be blamed for obesity in their children.			.439		.574
3 Someone or something is responsible for obesity in children, not luck.			-.403		
4 Genetics is a primary cause of obesity in children.					-.644
5 I don't believe other people control the obesity of children.					.559
6 It is by chance that some children are obese.		.694			
7 If it is meant to be, my child will become obese.		.744			
8 A child's obesity is a result of decisions made by other people in their lives.			.723		
9 Parents are responsible for the obesity of their children.			.717		
10 I cannot believe that chance is the cause of obesity in children.		.415	-.483		
11 Fast food restaurants are responsible for childhood obesity.				.861	
12 The mass production of food in the U.S. is a primary cause of obesity in kids.				.880	
13 The main thing that affects a child's obesity is what they do.	.541				
14 When a child is obese, he/she is to blame	.699				
15 No one is to blame when a child is obese.		.498			
16 A child's family has a lot to do with their becoming obese.			.726		
17 Television programs targeted at children contribute to obesity in kids.				.631	
18 A child cannot be to blame if he/she is obese.	.624		-.445		
19 No matter what obese children do, they will always be obese.		.698			
20 I believe children have control over their obesity.	.639				
21 Children are in control of their own weight.	.730				
22 A child's behaviors are not the reason for their obesity.	.428				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 6 iterations.

APPENDIX NN

PILOT STUDY C SECTION 2 ITEM MODIFICATIONS

Pilot C Item Modifications

Original Item	Modification	Rationale
#18 "A child cannot be to blamed is he/she is obese"	"A child is not responsible if he/she is obese"	Qualitative responses by participants to remove the word "blame"
#10 "I cannot believe that chance is the cause of obesity in children"	"I do not believe that chance is the cause of obesity in children"	Qualitative responses indicated difficulty in deciphering the item as a double negative
#5 "I do not believe other people control the obesity of children."	"I do not believe that a child's obesity is controlled by people in their lives"	Qualitative responses provided indication the wording of this item was too vague and made it challenging to respond to accurately
#3 "Someone or something is responsible for obesity, not luck"	Deleted	Too vague

APPENDIX OO

PILOT STUDY C SECTION 3 DESCRIPTIVE STATISTICS

Pilot C Descriptive Statistics Section 3 Data, mean, standard deviation, mode, and variance

Item # and CDC Focus Area SE Model level		*M* *SD*	*Mode*	*Variance*
Item #1 Educational and Community-Based Programs				
Institutional	Enhance PE classes with information about the outcomes associated with obesity	1.64 0.90	1.00	0.66
Social	Government sponsored incentives for schools to enhance healthy environments	2.21 *0.94*	1.00	1.23
Interpersonal	Develop online parent forums about obesity prevention	3.17 *0.95*	4.00	.88
Community	Community-sponsored health fairs	2.98 *0.66*	3.00	0.75
Item #2 Educational and Community-Based Programs				
Institutional	Increase physical activity opportunities for children within the structure of the regular school day	1.25 *0.42*	1.00	0.30
Interpersonal	Regularly offered parent-only physical activity awareness seminars	2.84 *0.52*	3.00	0.43
Community	Activity promotion delivered by Internet advertisements	3.66 *0.54*	4.00	0.45
Social	Local government and school collaboration to enhance school health education programs	2.24 *0.78*	2.00	0.73
Item #3 Environmental Health				
Community	Provide more parks and recreation supervised programs for children	1.56 *0.96*	1.00	0.79
Institutional	Hire additional school nurses to track obesity development in students	3.08 *1.05*	4.00	1.07
Interpersonal	Parents must ensure children have access to safe drinking water at home	2.78 *1.02*	3.00	0.96
Social	Improve air quality for children to play safely outdoors	2.58 *1.03*	2.00	0.90
Item #4 Environmental Health				
Social	Public programs and funds to improve walking and biking trails	1.70 *1.01*	1.00	0.66
Institutional	Schools open after hours for physical activity participation	1.85 *0.85*	2.00	0.68
Interpersonal	Parent reduction of the number of trips taken by car to increase outdoor air quality	3.15 *0.73*	3.00	0.70
Community	Develop a community-based obesity surveillance division to track and communicate trends of obesity in community	3.29 *0.99*	4.00	0.87
Item #5 Access to Quality Health Services				
Interpersonal	Computerized obesity tracking program managed by parents	2.89 *0.87*	3.00	0.75

Social	Reduce insurance premiums for healthy families	1.95 *1.01*	1.00	1.10
Community	Offer inexpensive community-wide programs promoting obesity prevention	1.79 *0.90*	1.00	0.78
Institutional	Computerized obesity tracking program managed by school nurses	3.37 *0.70*	4.00	0.65
Item #6 Access to Quality Health Services				
Community	Community-wide obesity risk assessment and screening	2.90 *0.96*	4.00	1.11
Institutional	Hospitals offer reduced price wellness classes to community youth	2.74 *1.24*	3.00	1.09
Social	Financial incentives for families choosing preventative medicine options	2.33 *1.00*	1.0	1.27
Interpersonal	Child counseling on prevention of obesity by trained instructors	2.02 *0.99*	1.0	1.05
Item #7 Nutrition and Overweight				
Interpersonal	Parental encouragement of fruit intake	2.47 *1.01*	3.0 0	1.12
Social	Legislation to enhance funding for research of obesity-related issues	3.25 *0.99*	4.0 0	0.84
Institutional	Modifications to school meals – reducing sodium, sugar, and fat content	1.50 *0.73*	1.0 0	0.56
Community	Increased media exposure of healthy food choices at the local level (i.e., posters around community)	2.78 *1.12*	3.0 0	0.84
Item #8 Nutrition and Overweight				
Community	Community subsidizes local growers by purchasing local foods for school lunch program	2.17 *1.07*	2.0 0	0.89
Institutional	Prohibit junk food or sugary sweets to be brought into school classrooms	1.98 *0.94*	1.0 0	1.03
Social	Increase tax on high fat foods	3.52 *0.96*	4.0 0	0.58
Interpersonal	Parents encourage the consumption of water	2.32 *0.97*	2.0 0	1.07
Item #9 Physical Activity and Exercise				
Interpersonal	Increase number of parents engaging in physical activities with children	1.90 *0.77*	1.0 0	0.95
Community	Establish neighborhood “walking school bus” program (parent-led walking route to school)	2.41 *0.85*	2.0 0	1.02
Social	Require percentage of annual state revenue to be allocated for physical activity programs	2.55 *1.08*	3.0 0	1.28
Institutional	School-based program designed to reduce television viewing	3.14 *0.99*	4.0 0	0.99
Item #10 Physical Activity and Nutrition				
Institutional	Religious groups provide family focused exercise classes	3.13 *0.76*	4.0 0	0.87
Social	Increase the number of public parks and recreation areas	1.85 *0.99*	1.0 0	0.92
Interpersonal	Parental restrictions on child’s television viewing time	2.24 *0.83*	2.0 0	1.16
Community	Public incentive programs for local business that promote physical activity	2.77 *0.96*	4.0 0	1.11

APPENDIX PP

PILOT STUDY C SECTION 3 QUALITATIVE FEEDBACK

ID#	*Please list any strategies that you did not see identified on the survey that you believe would be effective at reducing childhood obesity in your community*
113	Breakdown by elementary, middle and high schools
116	Parents and children need to be educated on the effects of obesity, as far as how becoming obese is not just an appearance thing, but can affect your health in the long run.
121	When I was in school there were after school sports programs volleyball, basketball, etc. I wondered why these stopped, were these program suggested in last questions
123	Healthy lunches and no sweet drinks or vending machines in student's areas. Bottled water at lower prices for student consumption throughout the day.
124	Providing safe sidewalks for student's parents to reach bus stops and schools.
130	Educate parents, students, and legislators
133	Lower cost for sports programs
134	School cafeteria should be better monitored for fresh foods. Should have better quality foods!!
135	You covered it all!!
139	Providing free transportation and "tran" activities for low socio-economic level children will increase involvement in community-based physical activity
142	Improve the nutritional value and calorie intake at the school level
143	Some of the outdoor exercise, I believe, does not happen because of safety issues in the community. If you don't feel safe at a park or even outside your home, you won't go and take advantage of the facilities
150	Home gardening, encouragement via community school "victory gardens". In Germany, they have community "walks".
152	Contest for healthy eating in schools ex: winner Had the most servings of fruits and vegs, whole grains, etc in a week- wins a prize
155	Perhaps a lunch menu monitoring system that allows <u>parents</u> to make the lunch choices (or at least see what the child's choice was) for the students. I know in our school cafeteria, there are a few days where cinnamon rolls, chocolate milk and ice cream can all be chosen by the student at one lunch. While I do talk to my child about wise food choices, sometimes I think temptation is still great.
156	Everything was covered
162	Organized sport teams beginning in 5th grade. Children like to be part of teams and groups. It would be nice to have a basketball or cheerleading in elementary schools if possible
166	Offer free fruit and vegetables to families who collect food stamps
169	Change children eating habits from an early age (parents and schools)
171	Mandatory inclusion of nutrition/ obesity in curriculum Poster contests for strategies/ nutrition tips, etc
173	Everything appeared to be covered
	More parent training Discount lunches for healthy eaters

178	If possible, can community schools make time for each class to have a 15-minute exercise warm up? Including teacher, with a signed permission slip
184	Lower cost of healthy foods for low income families
191	Increase the school day to allow some type of exercise, aerobic, jazz, dance, and study
192	I do believe that if parents should touch on obesity early on in life this would or could make a difference in whether our children will become obese or not. If in the beginning as a parent you see earlier that obese may be a factor in your child's life stat right then and there addressing the matter
197	Parental education on toxins in foods
198	Encourage or organize neighborhood playgroups - on playgrounds, at the pool, at a park, etc. Encourage schools, parents, and legislation to recognize the importance of more physical activity In the school day- PE should be every day or a min. of 3 times/week
202	More after school programs geared at physical fitness/activities"
205	I think it's up to the parents to keep their children physically active
209	Require part of state-funded PE classes to be devoted to healthy nutrition lessons
214	Emphasize healthy food in cafeteria
220	Get children outside at school rather than cutting PE and recess time
224	Increased efforts of physicians/pediatricians to monitor obesity and give parents tips
229	More recess time, More PE in schools
233	Teach new parents how to role model good eating habits and nutrition
235	Exercise programs for parents and children together
237	Though I agree 1 with some or part of the statements- I think asking one statement instead of including (example time and money) would give you a more clear response. I agree with counseling and school-rated program- however I do not see any place to note the sensitivity of the children who we are addressing. Hope this is helpful.
244	"Have fast food facilities to <u>not</u> have toy prizes that kids <u>must</u> have" "encourage fast food facilities to offer alternative food choices like fruit and milk - some have already done so" "provide more walking trails with adequate lighting" "mandatory recess and PE classes for <u>all</u> grades" "lower fruit and vegetable prices at grocery stores"
248	Add after school fitness clubs to the other clubs offered. Teach about healthy snacks, exercise and how to make healthier choices. Show amounts of sugar in popular snacks
253	GA educational recreation teams/sports
259	Encouraging vitamin intake
349	"You covered everything I could of thought of"
350	"More physical activity at school. They would learn more if there were given opportunities to move throughout the day"
352	"Healthy choice menus for parents and children"
353	"Less expensive sports activities for kids"
354	"I believe strongly in preventative medicine- naturopathic doctors need to

become more mainstream and need additional insurance companies who recognize these practices"

356 "Healthier food should cost less- Like tax idea on high fat foods "sin" tax for unhealthy food and activities"

359 "More physical activity in school" "No junk food allowed at school"

361 "Children are very smart and receptive there should have more preventative classes at school and with parents a lot encouragement. More programs to exercise children"

362 The scale used for Section 2 made it difficult to respond to questions for which two had ambivalent answers (both agree and disagree to some extent)

364 "Take junk food out of school lunch." "Don't hide the original food in fun stuff." "Do more PE and lower prices for after school physical activities" "Introduce healthy affordable options in fast food chains" "Do cooking and fruit/vegetable testing classes in schools"

378 "Keeping young children in the shopping cart at the grocery store, especially at the check out station. This would prevent them from seeing all the sugary foods being marketed toward them"

381 "Include nutrition as a part of regular school curriculum not just a part of PE"

382 "Add PE to school programs everyday K-12." "Take junk food/soda machines out of schools"

385 "Increased physical activity" "Increased number of sidewalks" "decrease time in car, TV and computer"

390 "Restructure food stamp program to limit choices with healthier foods (esp. for kids)"

391 Get children outside at school rather than cutting PE and recess time

APPENDIX QQ

PILOT STUDY C SECTION 3 ITEM MODIFICATION

Pilot C Section 3 Item Modifications

Original Item	Modification	Rationale
Item 4d "Develop a community-based obesity surveillance division to track and communicate trends of obesity in community"	"Develop a community-based obesity monitoring program to track and communicate trends of obesity in community ".	Qualitative responses indicated the term "surveillance" was inappropriate for the item
Item 4c "Parent reduction of the number of trips taken by car to increase outdoor air quality"	"Reduce the number of trips taken by car (per family) in effort to increase outdoor air quality"	Qualitative responses indicated additional specificity of the trips made by whom
Item 2d "Local government and school collaboration to enhance school health education programs"	"Increased collaboration between local governments and schools to enhance health education programs"	Order of wording increased the clarity of the item
Item 4 "Schools open after hours for physical activity participation"	"Keep schools open after hours for physical activity participation"	Wording order offered by participants
Item 3a " Provide more parks and recreation supervised programs from children"	"Provide more supervised parks and recreation programs for children"	Wording order suggested by participant debriefing responses
Item 6d "Child counseling on prevention of obesity by trained instructors"	"Child-focused counseling on obesity prevention by trained instructors"	Greater specificity needed in this item, as identified by participant responses and debriefing comments
Item 6c "Financial incentives for families choosing preventative medicine options"	"Financial incentive for families choosing prevention-based medical options"	Qualitative comment made by respondent "do you mean prescription drugs?" indicated that the phrasing of this item was being interpreted incorrectly and rewording was necessary

APPENDIX RR

PILOT STUDY D INFORMATIONAL LETTER

Dear Parent,

You are invited to participate in a research project titled, *What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity*. Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear and representative survey instrument. Your participation will involve the completion of a paper/pencil or electronic survey that describes various obesity prevention strategies. You will complete the survey during your regularly scheduled GPTA meeting or event and it will take approximately 10 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, any individually identifiable information obtained during this project will be kept confidential; your identity and personal information will not be disclosed or associated with your responses on the survey. If you choose to complete the electronic survey, beware that Internet communications are insecure and there is a limit to the confidentiality that can be guaranteed due to the technology itself. However once the materials are received by the researcher, standard confidentiality procedures will be employed and any personal identifiable information will be removed and destroyed.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By completing and returning this survey in the envelope provided or navigating to https://www.surveymonkey.com/s.aspx?sm=6g9JKOPthb4vHV3_2f9xkb1g_3d_3d and completing the survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration. Please keep a copy of this letter for your records.
Sincerely,
Emily M. Jones
Department of Kinesiology University of Georgia 706-542-4210

APPENDIX SS

PILOT STUDY D INSTRUMENT PAPER PENCIL

PARENTS PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

Dear Parent,

You are invited to participate in a research project titled, "What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity."

Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear survey instrument. Your participation will involve the completion of this electronic survey that describes various obesity prevention strategies. You will complete the survey at your leisure and it will take approximately 10 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, there will no identifiable information collected during this project, so your identity and personal information will not be disclosed or associated with your responses on the survey.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me (ejones@uga.edu) or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By proceeding to complete this survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

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THE UNIVERSITY OF GEORGIA

SECTION 1

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in one of the five selection choices.	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	If a child is obese, it is a result of his/her own behaviors.					
2	Parents should not be blamed for obesity in their children.					
3	Genetics is a primary cause of obesity in children.					
4	I do not believe that a child's obesity is controlled by people in					
5	It is by chance that some children are obese.					
6	If it is meant to be, my child will become obese.					
7	A child's obesity is a result of decisions made by other people in					
8	Parents are responsible for the obesity of their children.					
9	I do not believe that chance is the cause of obesity in children.					
10	Fast food restaurants are responsible for childhood obesity.					
11	The mass production of food in the U.S. is a primary cause of					
12	The main thing that affects a child's obesity is what they do.					
13	When a child is obese, he/she is to blame					
14	No one is to blame when a child is obese.					
15	A child's family has a lot to do with their becoming obese.					
16	Television programs targeted at children contribute to obesity in kids.					
17	A child is not responsible if he/she is obese.					
18	No matter what obese children do, they will always be obese.					
19	I believe children have control over their obesity.					
20	Children are in control of their own weight.					
21	A child's behaviors are not the reason for their obesity.					

SECTION 2

DIRECTIONS:
For each group listed below, please rank the four childhood obesity prevention strategies based upon which you would most prefer/support if implemented in your community. Place a 1 next to your first choice, 2 next to your second choice, 3 for your third choice, and 4 next to your last choice.
Please use each number only one time per grouping.

1.

_____Enhance PE classes with information about the outcomes associated with obesity
_____Government sponsored incentives for schools to enhance healthy environments
_____Develop online parent forums about obesity prevention
_____Community-sponsored health fairs

2.

_____Increase physical activity opportunities for children within the structure of the regular school day
_____Regularly offered parent-only physical activity awareness seminars
_____Activity promotion delivered by Internet advertisements
_____Increased collaboration between local governments and schools to enhance health education programs

3.

_____Provide more supervised parks and recreation programs for children
_____Hire additional school nurses to track obesity development in students
_____Parents must ensure children have access to safe drinking water at home
_____Improve air quality for children to play safely outdoors

4.

_____Public programs and funds to improve walking and biking trails
_____Keep schools open after hours for physical activity participation
_____Reduce the number trips taken by car (per family) in effort to increase outdoor air quality
_____Develop a community-based obesity monitoring program to track and communicate trends of obesity in community

5.

_____Computerized obesity tracking program managed by parents
_____Reduce insurance premiums for healthy families
_____Offer inexpensive community-wide programs promoting obesity prevention
_____Computerized obesity tracking program managed by school nurses

6.

_____Community-wide obesity risk assessment and screening
_____Hospitals offer reduced price wellness classes to community youth
_____Financial incentives for families choosing prevention-based medical options
_____Child-focused counseling on obesity prevention by trained instructors

7.

_____Parental encouragement of fruit intake
_____Enhanced legislative funding of obesity-related nutrition programs and research
_____Modifications to school meals – reducing sodium, sugar, and fat content
_____Increased media exposure of healthy food choices at the local level
(i.e., posters around community)

8.

_____Community subsidizes local growers by purchasing local foods for school lunch program
_____Prohibit junk food or sugary sweets to be brought into school classrooms
_____Increase tax on high fat foods
_____Parents encourage the consumption of water

9.

_____Increase number of parents engaging in physical activities with children
_____Establish neighborhood "walking school bus" programs (parent-led walking route to school)
_____Require percentage of annual state revenue to be allocated for physical activity programs
_____School-based program designed to reduce television viewing

10.

_____Religious groups provide family focused exercise classes
_____Increase the number of public parks and recreation areas
_____Parental restrictions on child's television viewing time
_____Public incentive programs for local business that promote physical activity

DEMOGRAPHIC INFORMATION

AGE: ❑ 20-30 ❑ 31-40 ❑ 41-50 ❑ 51-60 ❑ 60+

SEX: ❑ Male ❑ Female

RACE/ETHNICITY- choose one of the following categories you most identify with:

- ❑ White/Caucasian
- ❑ Black / African American
- ❑ Asian/Pacific Islander, Hawaiian
- ❑ American Indian, Alaskan Native/Aleut Eskimo
- ❑ Hispanic/ Latino(a)
- ❑ Bi-Racial/ Multi-Racial

MARTIAL STATUS: ❑ Married ❑ Divorced ❑ Single

EDUCATIONAL LEVEL: ❑ Less than high school ❑ High school or equivalent
❑ Some college ❑ College graduate ❑ Advanced Degree

ANNUAL INCOME:
❑ Less than $20,000 ❑ $21,000-$30,000 ❑ $31,000-$40,000
❑ $41,000-$50,000 ❑ $51,000-$60,000 ❑ $61,000-$70,000
❑ $71,000-$80,000 ❑ $81,000-$90,000 ❑ Greater than $90,000

DO YOU HAVE CHILDREN: ❑ Yes ❑ No

AGE(S) OF YOUR CHILDREN:_____

GRADE LEVEL OF YOUR CHILDREN- please check all that apply:

- ❑ Pre School
- ❑ Elementary (K-5th)
- ❑ Middle School (6th-8th)
- ❑ High School(9th-12th)
- ❑ College

ZIP/ POSTAL CODE:_____

Thank you for your assistance. Your time is greatly appreciated.

If you have additional questions or comments please contact me via email: ejones@uga.edu or by phone: (706) 542-4210.

Thank you,

Emily Jones
Dr. Paul G. Schempp

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APPENDIX TT

PILOT STUDY D INSTRUMENT ELECTRONIC

Parent Perceptions of Solutions to Childhood Obesity.

1. Welcome and Survey Introduction

Dear Parent,

You are invited to participate in a research project titled, "What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity."

Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear survey instrument. Your participation will involve the completion of this electronic survey that describes various obesity prevention strategies. You will complete the survey at your leisure and it will take approximately 10 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, there will no identifiable information collected during this project, so your identity and personal information will not be disclosed or associated with your responses on the survey.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me (ejones@uga.edu) or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By proceeding to complete this survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Parent Perceptions of Solutions to Childhood Obesity.

2. Parent Locus of Control of Childhood Obesity

Directions: Please respond to each of the following statements by placing a check mark in one of the five selection choices.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. If a child is obese, it is a result of his/her own behaviors.	○	○	○	○	○
2. Parents should not be blamed for obesity in their children.	○	○	○	○	○
3. Genetics is a primary cause of obesity in children.	○	○	○	○	○
4. I do not believe that a child's obesity is controlled by people in their lives.	○	○	○	○	○
5. It is by chance that some children are obese.	○	○	○	○	○
6. If it is meant to be, my child will become obese.	○	○	○	○	○
7. A child's obesity is a result of decisions made by other people in their lives.	○	○	○	○	○
8. Parents are responsible for the obesity of their children.	○	○	○	○	○
9. I do not believe that chance is the cause of obesity in children.	○	○	○	○	○
10. Fast food restaurants are responsible for childhood obesity.	○	○	○	○	○
11.The mass production of food in the U.S. is a primary cause of obesity in kids.	○	○	○	○	○
12. The main thing that affects a child's obesity is what they do.	○	○	○	○	○
13. When a child is obese, he/she is to blame	○	○	○	○	○
14. No one is to blame when a child is obese.	○	○	○	○	○
15. A child's family has a lot to do with their becoming obese.	○	○	○	○	○
16. Television programs targeted at children contribute to obesity in kids.	○	○	○	○	○
17. A child is not responsible if he/she is obese.	○	○	○	○	○
18. No matter what obese children do, they will always be obese.	○	○	○	○	○
19. I believe children have control over their obesity.	○	○	○	○	○
20. Children are in control of their own weight.	○	○	○	○	○
21. A child's behaviors are not the reason for their obesity.	○	○	○	○	○

Parent Perceptions of Solutions to Childhood Obesity.

3. Rank Ordered Support of Potential Solutions to Childhood Obesity

Directions: For each group listed below, please rank the four childhood obesity prevention strategies based upon which you would most prefer/support if implemented in your community.

1

	1st Choice	2nd Choice	3rd Choice	4th Choice
Enhance PE classes with information about the outcomes associated with obesity	○	○	○	○
Government sponsored incentives for schools to enhance healthy environments	○	○	○	○
Develop online parent forums about obesity prevention	○	○	○	○
Community-sponsored health fairs	○	○	○	○

2

	1st Choice	2nd Choice	3rd Choice	4th Choice
Increase physical activity opportunities for children within the structure of the regular school day	○	○	○	○
Regularly offered parent-only physical activity awareness seminars	○	○	○	○
Activity promotion delivered by internet advertisements	○	○	○	○
Increased collaboration between local governments and schools to enhance health education programs	○	○	○	○

3

	1st Choice	2nd Choice	3rd Choice	4th Choice
Provide more supervised parks and recreation programs for children	○	○	○	○
Hire additional school nurses to track obesity development in students	○	○	○	○
Parents must ensure children have access to safe drinking water at home	○	○	○	○
Improve air quality for children to play safely outdoors	○	○	○	○

Parent Perceptions of Solutions to Childhood Obesity.

4

	1st Choice	2nd Choice	3rd Choice	4th Choice
Public programs and funds to improve walking and biking trails	○	○	○	○
Keep schools open after hours for physical activity participation	○	○	○	○
Reduce the number of trips taken by car (per family) in effort to increase outdoor air quality	○	○	○	○
Develop a community-based obesity monitoring program to track and communicate trends of obesity in community	○	○	○	○

5

	1st Choice	2nd Choice	3rd Choice	4th Choice
Computerized obesity tracking program managed by parents	○	○	○	○
Reduce insurance premiums for healthy families	○	○	○	○
Offer inexpensive community-wide programs promoting obesity prevention	○	○	○	○
Computerized obesity tracking program managed by school nurses	○	○	○	○

6

	1st Choice	2nd Choice	3rd Choice	4th Choice
Community-wide obesity risk assessment and screening	○	○	○	○
Hospitals offer reduced price wellness classes to community youth	○	○	○	○
Financial incentive for families choosing prevention-based medical options	○	○	○	○
Child-focused counseling on obesity prevention by trained instructors	○	○	○	○

7

	1st Choice	2nd Choice	3rd Choice	4th Choice
Parental encouragement of fruit intake	○	○	○	○
Enhanced legislative funding of obesity-related nutrition programs and research	○	○	○	○
Modifications to school meals – reducing sodium, sugar, and fat content	○	○	○	○
Increased media exposure of healthy food choices at the local level (i.e., posters around community)	○	○	○	○

Parent Perceptions of Solutions to Childhood Obesity.

8

	1st Choice	2nd Choice	3rd Choice	4th Choice
Community subsidizes local growers by purchasing local foods for school lunch program	○	○	○	○
Prohibit junk food or sugary sweets to be brought into school classrooms	○	○	○	○
Increase tax on high fat foods	○	○	○	○
Parents encourage the consumption of water	○	○	○	○

9

	1st Choice	2nd Choice	3rd Choice	4th Choice
Increase the number of parents engaging in physical activities with children	○	○	○	○
Establish neighborhood "walking school bus" program (parent-led walking route to school)	○	○	○	○
Require percentage of annual state revenue to be allocated for physical activity programs	○	○	○	○
School-based program designed to reduce television viewing	○	○	○	○

10

	1st Choice	2nd Choice	3rd Choice	4th Choice
Religious groups provide family focused exercise classes	○	○	○	○
Increase the number of public parks and recreation areas	○	○	○	○
Parental restrictions on child's television viewing time	○	○	○	○
Public incentive programs for local business that promote physical activity	○	○	○	○

Parent Perceptions of Solutions to Childhood Obesity.

4. Demographics

Demographic Information

Age

○ 20-30 ○ 31-40 ○ 41-50 ○ 51-60 ○ 60+

Sex

○ Male ○ Female

Race/Ethnicity- choose one of the following categories you most identify with

○ White/ Caucasian
○ Black/ African American
○ Asian/ Pacific Islander, Hawaiian
○ American Indian, Alaskan Native/ Aluet Eskimo
○ Hispanic/ Latino(a)
○ Bi-Racial/ Multi-Racial

Marital Status

○ Married ○ Divorced ○ Single

Educational Level

○ Less than High School
○ High School or Equivalent
○ Some College
○ College Graduate
○ Advanced Degree

Annual Income (family)

○ Less than $20,000 ○ $41,000- $50,000 ○ $71,000- $80,000
○ $21,000- $30,000 ○ $51,000- $60,000 ○ $81,000- $90,000
○ $31,000- $40,000 ○ $61,000- $70,000 ○ Greater than $90,000

Do you have children?

○ Yes ○ No

Age(s) of your children

Parent Perceptions of Solutions to Childhood Obesity.

Grade level of your children (please check all that apply)

- ☐ Pre-K
- ☐ Elementary (K-5th)
- ☐ Middle School (6th-8th)
- ☐ High School (9th-12th)
- ☐ College

This data will only be used for analysis.

ZIP/Postal Code:

Parent Perceptions of Solutions to Childhood Obesity.

5. Thank you and Conclusion

Thank you for your assistance. Your time is greatly appreciated.

If you have additional questions or comments please feel free to contact me via email: ejones@uga.edu or by phone: 706-542-4210.

Thank you.

Emily Jones
Dr. Paul G Schempp

APPENDIX UU

PILOT STUDY D KMO & BARTLETT'S TEST DATA

Pilot D for Kaiser-Meyer-Olkin and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.752
Bartlett's Test of Sphericity	Approx. Chi-Square	1064.374
	df	210
	Sig.	.000

APPENDIX VV

PILOT STUDY D ITEM CORRELATIONS

	1	2	3	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1																					
2																					
3																					
4		.425																			
5																					
6		-.470			.407																
7																					
8							.515														
9																					
10																					
11										.698											
12																					
13	.520																				
14																					
15		.406																			
16																					
17																					
18																					
19																					
20																			.550		
21																					

APPENDIX WW

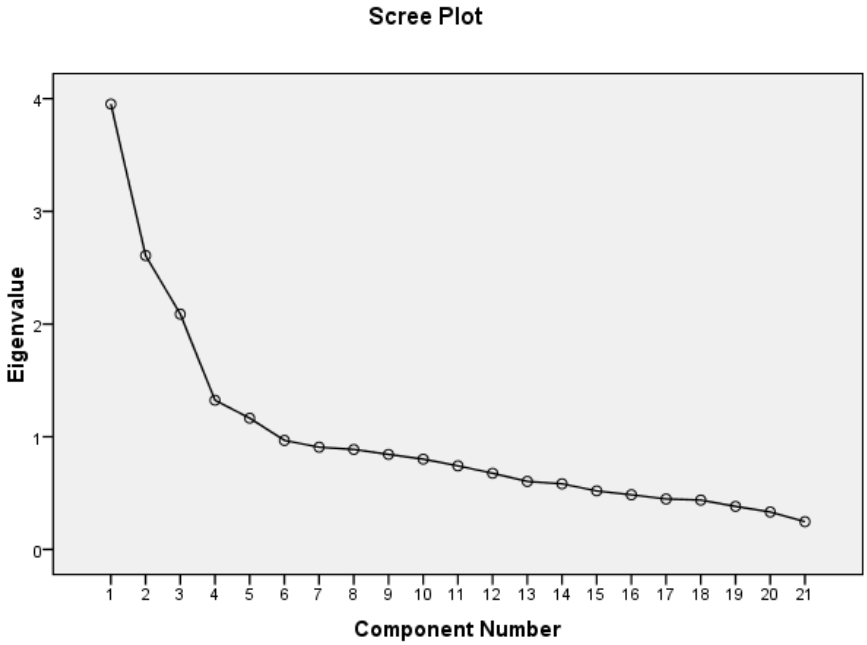
PILOT STUDY D CHILDHOOD OBESITY LOCUS OF CONTROL TOTAL VARIANCE EXPLAINED

Pilot D Total Variance Explained

	Initial Eigenvalues		
Component	Eigenvalues Total	% of Variance	Cumulative %
1	3.95	18.820	18.820
2	2.60	12.419	31.239
3	2.08	9.943	41.182
4	1.32	6.304	47.487
5	1.16	5.545	53.032
6	.968	4.608	57.640
7	.907	4.321	61.961
8	.888	4.227	66.188
9	.843	4.016	70.204
10	.801	3.815	74.019
11	.742	3.533	77.552
12	.676	3.220	80.772
13	.604	2.874	83.646
14	.582	2.774	86.420
15	.520	2.474	88.894
16	.485	2.310	91.204
17	.448	2.133	93.336
18	.438	2.086	95.422
19	.382	1.820	97.242
20	.333	1.584	98.826
21	.247	1.174	100.00

APPENDIX XX

PILOT STUDY D CHILDHOOD OBESITY LOCUS OF CONTROL SCREE PLOT



APPENDIX YY

PILOT STUDY D UN-ROTATED COMPONENT MATRIX 4 COMPONENTS

Pilot D Component Matrix item and loadings on 5 retained components

	Component			
	1	2	3	4
Percent variance explained	*18.82*	*12.41*	*9.94*	*6.30*
1. If a child is obese, it is a result of his/her own behaviors.		.712		
2. Parents should not be blamed for obesity in their children.	-.722			
3. Genetics is a primary cause of obesity in children.	.563			
4. I do not believe that a child's obesity is controlled by people in their lives.	-.594			
5. It is by chance that some children are obese.	.633			
6. If it is meant to be, my child will become obese.	.652			
7. A child's obesity is a result of decisions made by other people in their lives.	-.452		.479	
8. Parents are responsible for the obesity of their children.			.524	
9. I do not believe that chance is the cause of obesity in children.				.717
10. Fast food restaurants are responsible for childhood obesity.	.517		.614	
11. The mass production of food in the U.S. is a primary cause of obesity in kids.	.453		.635	
12. The main thing that affects a child's obesity is what they do.			.478	
13. When a child is obese, he/she is to blame		.739		
14. No one is to blame when a child is obese.	.605			
15. A child's family has a lot to do with their becoming obese.	-.551			
16. Television programs targeted at children contribute to obesity in kids.			.573	
17. A child is not responsible if he/she is obese.		.515		
18. No matter what obese children do, they will always be obese.	.436			
19. I believe children have control over their obesity.		.708		
20. Children are in control of their own weight.		.673		
21. A child's behaviors are not the reason for their obesity.		.431		

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

APPENDIX ZZ

PILOT STUDY D ROTATED COMPONENTS MATRIX

Pilot D Rotated Component Matrix, item, percent variance explained				
	Component			
	1	2	3	4
Percent variance explained (%)	*15.98*	*12.33*	*10.14*	*8.27*
1. If a child is obese, it is a result of his/her own behaviors.		.720		
2. Parents should not be blamed for obesity in their children.	-.721			
3. Genetics is a primary cause of obesity in children.	.514			
4. I do not believe that a child's obesity is controlled by people in their lives.	-.723			
5. It is by chance that some children are obese.	.663			
6. If it is meant to be, my child will become obese.	.682			
7. A child's obesity is a result of decisions made by other people in their lives.				.701
8. Parents are responsible for the obesity of their children.				.825
9. I do not believe that chance is the cause of obesity in children.				
10. Fast food restaurants are responsible for childhood obesity.			.840	
11. The mass production of food in the U.S. is a primary cause of obesity in kids.			.805	
12. The main thing that affects a child's obesity is what they do.				.468
13. When a child is obese, he/she is to blame		.731		
14. No one is to blame when a child is obese.	.432			
15. A child's family has a lot to do with their becoming obese.	-.539			
16. Television programs targeted at children contribute to obesity in kids.			.588	
17. A child is not responsible if he/she is obese.		.445		
18. No matter what obese children do, will always be obese.	.442			
19. I believe children have control over their obesity.		.717		
20. Children are in control of their own weight.		.717		
21. A child's behaviors are not the reason for their obesity.				
a. Rotation converged in 7 iterations.				

APPENDIX AAA

PILOT STUDY D SOLUTIONS TO CHILDHOOD OBESITY DESCRIPTIVE STATISTICS OF PARTICIPANT RANK ORDER DATA

Descriptive Statistics of Solutions to Childhood Obesity, mean, standard deviation, mode, and variance

CDC Focus Area & Item #	SEM Category	*M* *SD*	*Mode*	*Variance*
Item #1 Educational and Community-Based Programs				
Institutional	Enhance PE classes with information about the outcomes associated with obesity	1.46 *0.68*	1	0.47
Social	Government sponsored incentives for schools to enhance healthy environments	2.29 *1.10*	2	1.21
Interpersonal	Develop online parent forums about obesity prevention	3.16 *0.91*	4	0.83
Community	Community-sponsored health fairs	3.06 *0.80*	3	0.64
Item #2 Educational and Community-Based Programs				
Institutional	Increase physical activity opportunities for children within the structure of the regular school day	1.19 *0.48*	1	0.23
Interpersonal	Regularly offered parent-only physical activity awareness seminars	2.68 *0.70*	3	0.48
Community	Activity promotion delivered by Internet advertisements	3.69 *0.57*	4	0.33
Social	Increased collaboration between local governments and schools to enhance health education programs	2.44 *0.88*	2	0.79
Item #3 Environmental Health				
Community	Provide more supervised parks and recreation programs for children	1.37 *0.72*	1	0.52
Institutional	Hire additional school nurses to track obesity development in students	2.93 *1.01*	4	1.02
Interpersonal	Parents must ensure children have access to safe drinking water at home	2.70 *0.97*	3	0.94
Social	Improve air quality for children to play safely outdoors	3.01 *0.88*	3	0.77
Item #4 Environmental Health				
Social	Public programs and funds to improve walking and biking trails	1.66 *0.75*	1	0.58
Institutional	Keep schools open after hours for physical activity participation	1.81 *0.80*	2	0.64
Interpersonal	Reduce the number of trips taken by car (per family) in effort to increase outdoor air quality	3.43 *0.82*	4	0.67
Community	Develop a community-based obesity monitoring program to track and communicate trends of obesity in	3.10 *0.84*	3	0.71

	community			
Item #5 Access to Quality Health Services				
Interpersonal	Computerized obesity tracking program managed by parents	2.99 *0.92*	3	0.85
Social	Reduce insurance premiums for healthy families	1.85 *1.03*	1	1.05
Community	Offer inexpensive community-wide programs promoting obesity prevention	1.91 *0.92*	2	0.84
Institutional	Computerized obesity tracking program managed by school nurses	3.26 *0.83*	4	0.69
Item #6 Access to Quality Health Services				
Community	Community-wide obesity risk assessment and screening	2.89 *1.14*	4	1.14
Institutional	Hospitals offer reduced price wellness classes to community youth	2.65 *0.94*	3	0.94
Social	Financial incentive for families choosing prevention-based medical options	2.07 *1.32*	1	1.32
Interpersonal	Child-focused counseling on obesity prevention by trained instructors	2.39 *1.26*	2	1.26
Item #7 Nutrition and Overweight				
Interpersonal	Parental encouragement of fruit intake	2.19 *1.02*	1	1.04
Social	Enhanced legislative funding of obesity-related nutrition programs and research	3.18 *0.94*	4	0.87
Institutional	Modifications to school meals – reducing sodium, sugar, and fat content	1.51 *0.74*	1	0.55
Community	Increased media exposure of healthy food choices at the local level (i.e., posters around community)	3.12 *0.78*	3	0.62
Item #8 Nutrition and Overweight				
Community	Community subsidizes local growers by purchasing local foods for school lunch program	2.14 *0.99*	2	0.98
Institutional	Prohibit junk food or sugary sweets to be brought into school classrooms	2.07 *1.00*	1	1.00
Social	Increase tax on high fat foods	3.50 *0.81*	4	0.65
Interpersonal	Parents encourage the consumption of water	2.29 *1.01*	2	1.02
Item #9 Physical Activity and Exercise				
Interpersonal	Increase the number of parents engaging in physical activities with children	1.70 *0.91*	1	0.83
Community	Establish neighborhood “walking school bus” program (parent-led walking route to school)	2.40 *1.01*	2	1.01
Social	Require percentage of annual state revenue to be allocated for physical activity programs	2.78 *1.10*	4	1.21
Institutional	School-based program designed to reduce television viewing	3.12 *0.93*	4	0.86

Item #10 Physical Activity and Nutrition				
Institutional	Religious groups provide family focused exercise classes	3.11 *1.00*	4	1.01
Social	Increase the number of public parks and recreation areas	1.97 *0.92*	1	0.84
Interpersonal	Parental restrictions on child's television viewing time	2.11 *1.13*	1	1.28
Community	Public incentive programs for local business that promote physical activity	2.81 *1.00*	3	0.99

APPENDIX BBB

PILOT STUDY D INTERACTION BETWEEN INTERNALITY LOCUS OF CONTROL BELIEF AND FIRST CHOICE SOLUTION

First Choice Solution Frequency of Low (n= 59) and High (n=52) Internality Factor Scores

Education and Community-Based Programs Item #1		Low	High
Institutional	Enhance PE classes with information about the outcomes associated with obesity	46.67%	78.85%
Social	Government sponsored incentives for schools to enhance healthy environments	40.00%	13.46%
Interpersonal	Develop online parent forums about obesity prevention	10.00%	3.85%
Community	Community-sponsored health fairs	3.33%	3.85%
Education and Community-Based Programs Item #2			
Institutional	Increase physical activity opportunities for children within the structure of the regular school day	86.67%	80.77%
Interpersonal	Regularly offered parent-only physical activity awareness seminars	0.00%	9.62%
Community	Activity promotion delivered by Internet advertisements	0.00%	1.92%
Social	Increased collaboration between local governments and schools to enhance health education programs	13.33%	7.69%
Environmental Health Item #3		Low	High
Community	Provide more supervised parks and recreation programs for children	76.67%	78.85%
Institutional	Hire additional school nurses to track obesity development in students	8.33%	7.69%
Interpersonal	Parents must ensure children have access to safe drinking water at home	11.67%	7.69%
Social	Improve air quality for children to play safely outdoors	3.33%	5.77%
Environmental Health Item #4			
Social	Public programs and funds to improve walking and biking trails	55.00%	44.23%
Institutional	Keep schools open after hours for physical activity participation	35.00%	44.23%
Interpersonal	Reduce the number of trips taken by car (per family) in effort to increase outdoor air quality	5.00%	5.77%
Community	Develop a community-based obesity monitoring program to track and communicate trends of obesity in community	5.00%	5.77%
Access to Quality Health Services Item #5		Low	High
Interpersonal	Computerized obesity tracking program managed by parents	8.33%	11.54%
Social	Reduce insurance premiums for healthy families	38.33%	65.38%
Community	Offer inexpensive community-wide programs promoting obesity prevention	51.67%	19.23%
Institutional	Computerized obesity tracking program managed by school nurses	1.67%	3.85%
Access to Quality Health Services Item #6			
Community	Community-wide obesity risk assessment and screening	10.00%	15.38%

Institutional	Hospitals offer reduced price wellness classes to community youth	15.00%	11.54%
Social	Financial incentive for families choosing prevention-based medical options	46.67%	50.00%
Interpersonal	Child-focused counseling on obesity prevention by trained instructors	28.33%	23.08%
Nutrition and Overweight Item #7		Low	High
Interpersonal	Parental encouragement of fruit intake	26.67%	40.38%
Social	Enhanced legislative funding of obesity-related nutrition programs and research	1.67%	5.77%
Institutional	Modifications to school meals – reducing sodium, sugar, and fat content	70.00%	48.08%
Community	Increased media exposure of healthy food choices at the local level (i.e., posters around community)	1.67%	5.77%
Nutrition and Overweight Item #8			
Community	Community subsidizes local growers by purchasing local foods for school lunch program	45.00%	23.08%
Institutional	Prohibit junk food or sugary sweets to be brought into school classrooms	25.00%	36.54%
Social	Increase tax on high fat foods	6.67%	1.92%
Interpersonal	Parents encourage the consumption of water	23.33%	38.46%
Physical Activity and Exercise Item #9		Low	High
Interpersonal	Increase the number of parents engaging in physical activities with children	53.33%	63.46%
Community	Establish neighborhood “walking school bus” program (parent-led walking route to school)	15.00%	17.31%
Social	Require percentage of annual state revenue to be allocated for physical activity programs	23.33%	9.62%
Institutional	School-based program designed to reduce television viewing	8.33%	9.62%
Physical Activity and Exercise Item #10			
Institutional	Religious groups provide family focused exercise classes	6.67%	17.31%
Social	Increase the number of public parks and recreation areas	48.33%	26.92%
Interpersonal	Parental restrictions on child’s television viewing time	38.33%	48.08%
Community	Public incentive programs for local business that promote physical activity	6.67%	7.69%

APPENDIX CCC

FINAL INSTRUMENT 27 ITEMS

PARENTS PERCEPTIONS OF SOLUTIONS TO CHILDHOOD OBESITY

Dear Parent,

You are invited to participate in a research project titled, "What do parents say about childhood obesity prevention? Developing a valid survey instrument to measure parent's perception of solutions to childhood obesity."

Through this project, I am learning what parents think are valuable strategies to reduce childhood obesity and in particular, what strategies parents would support if implemented within the town they live. The purpose of this project is to develop a valid and reliable survey instrument that will capture parent's perceptions of solutions to childhood obesity.

If you decide to be part of this project, your contributions will assist in the development of a clear survey instrument. Your participation will involve the completion of this electronic survey that describes various obesity prevention strategies. You will complete the survey at your leisure and it will take approximately 10 minutes.

Your involvement in this study is voluntary, and you may choose not to participate or stop at any time without penalty or loss of benefits to which you were otherwise entitled. Additionally, there will no identifiable information collected during this project, so your identity and personal information will not be disclosed or associated with your responses on the survey.

The findings from this project will assist in developing a survey instrument to inform program administrators as to what parents know and believe to be value solutions to childhood obesity. There are no known risks or discomforts associated with this research.

If you have any questions or concerns you can always ask me (ejones@uga.edu) or call my research advisor, Dr. Paul Schempp at the following number: 706-542-4379. By proceeding to complete this survey, you are agreeing to participate in the above described research project.

Thank you for your time and consideration.

Sincerely,

Emily M. Jones
Department of Kinesiology
University of Georgia

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Georgia PTA
everychild. onevoice.

DEPARTMENT OF KINESIOLOGY
THE UNIVERSITY OF GEORGIA

SECTION 1

	DIRECTIONS: Please respond to each of the following statements by placing a check mark in one of the five selection choices.	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	If a child is obese, it is a result of his/her own behaviors.					
2	Genetics is a primary cause of obesity in children.					
3	It is by chance that some children are obese.					
4	If it is meant to be, my child will become obese.					
5	A child's obesity is a result of decisions made by other people in their lives.					
6	Parents are responsible for the obesity of their children.					
7	I do not believe that chance is the cause of obesity in children.					
8	Fast food restaurants are responsible for childhood obesity.					
9	The mass production of food in the U.S. is a primary cause of obesity in kids.					
10	The main thing that affects a child's obesity is what they do.					
11	When a child is obese, he/she is to blame					
12	No one is to blame when a child is obese.					
13	Television programs targeted at children contribute to obesity in kids.					
14	A child is not responsible if he/she is obese.					
15	No matter what obese children do, they will always be obese.					
16	I believe children have control over their obesity.					
17	Children are in control of their own weight.					
18	A child's behaviors are not the reason for their obesity.					

SECTION 2

DIRECTIONS:

For each group listed below, please rank the four childhood obesity prevention strategies based upon which you would most prefer/support if implemented in your community. Place a 1 next to your first choice, 2 next to your second choice, 3 for your third choice, and 4 next to your last choice. Please use each number only one time per grouping.

1.

_____Enhance PE classes with information about the outcomes associated with obesity
_____Government sponsored incentives for schools to enhance healthy environments
_____Develop online parent forums about obesity prevention
_____Community-sponsored health fairs

2.

_____Increase physical activity opportunities for children within the structure of the regular school day
_____Regularly offered parent-only physical activity awareness seminars
_____Activity promotion delivered by Internet advertisements
_____Increased collaboration between local governments and schools to enhance health education programs

3.

_____Provide more supervised parks and recreation programs for children
_____Hire additional school nurses to track obesity development in students
_____Parents must ensure children have access to safe drinking water at home
_____Improve air quality for children to play safely outdoors

4.

_____Public programs and funds to improve walking and biking trails
_____Keep schools open after hours for physical activity participation
_____Reduce the number trips taken by car (per family) in effort to increase outdoor air quality
_____Develop a community-based obesity monitoring program to track and communicate trends of obesity in community

5.

_____Computerized obesity tracking program managed by parents
_____Reduce insurance premiums for healthy families
_____Offer inexpensive community-wide programs promoting obesity prevention
_____Computerized obesity tracking program managed by school nurses

6.

_____Community-wide obesity risk assessment and screening
_____Hospitals offer reduced price wellness classes to community youth
_____Financial incentives for families choosing prevention-based medical options
_____Child-focused counseling on obesity prevention by trained instructors

7.

_____Parental encouragement of fruit intake
_____Enhanced legislative funding of obesity-related nutrition programs and research
_____Modifications to school meals – reducing sodium, sugar, and fat content
_____Increased media exposure of healthy food choices at the local level
(i.e., posters around community)

8.

_____Community subsidizes local growers by purchasing local foods for school lunch program
_____Prohibit junk food or sugary sweets to be brought into school classrooms
_____Increase tax on high fat foods
_____Parents encourage the consumption of water

9.

_____Increase number of parents engaging in physical activities with children
_____Establish neighborhood "walking school bus" programs (parent-led walking route to school)
_____Require percentage of annual state revenue to be allocated for physical activity programs
_____School-based program designed to reduce television viewing

10.

_____Religious groups provide family focused exercise classes
_____Increase the number of public parks and recreation areas
_____Parental restrictions on child's television viewing time
_____Public incentive programs for local business that promote physical activity

DEMOGRAPHIC INFORMATION

AGE: ❑ 20-30 ❑ 31-40 ❑ 41-50 ❑ 51-60 ❑ 60+

SEX: ❑ Male ❑ Female

RACE/ETHNICITY- choose one of the following categories you most identify with:

- ❑ White/Caucasian
- ❑ Black / African American
- ❑ Asian/Pacific Islander, Hawaiian
- ❑ American Indian, Alaskan Native/Aleut Eskimo
- ❑ Hispanic/ Latino(a)
- ❑ Bi-Racial/ Multi-Racial

MARTIAL STATUS: ❑ Married ❑ Divorced ❑ Single

EDUCATIONAL LEVEL: ❑ Less than high school ❑ High school or equivalent
❑ Some college ❑ College graduate ❑ Advanced Degree

ANNUAL INCOME:
❑ Less than $20,000 ❑ $21,000-$30,000 ❑ $31,000-$40,000
❑ $41,000-$50,000 ❑ $51,000-$60,000 ❑ $61,000-$70,000
❑ $71,000-$80,000 ❑ $81,000-$90,000 ❑ Greater than $90,000

DO YOU HAVE CHILDREN: ❑ Yes ❑ No

AGE(S) OF YOUR CHILDREN:_____

GRADE LEVEL OF YOUR CHILDREN- please check all that apply:

- ❑ Pre School
- ❑ Elementary (K-5th)
- ❑ Middle School (6th-8th)
- ❑ High School(9th-12th)
- ❑ College

ZIP/ POSTAL CODE:_____

Thank you for your assistance. Your time is greatly appreciated.

If you have additional questions or comments please contact me via email: ejones@uga.edu or by phone: (706) 542-4210.

Thank you,

Emily Jones
Dr. Paul G. Schempp

Georgia PTA
everychild. onevoice.

DEPARTMENT OF KINESIOLOGY
THE UNIVERSITY OF GEORGIA