TEENAGE WAIST-LAND: SOCIAL AND ENVIRONMENTAL DETERMINANTS OF CHILDHOOD OBESITY

by

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ABSTRACT

TEENAGE WAIST-LAND: SOCIAL AND ENVIRONMENTAL

DETERMINANTS OF CHILDHOOD OBESITY

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In the past three decades, childhood obesity has emerged as a growing concern for authorities in diverse disciplines. Authorities in law, economics, medicine, nursing, psychiatry, education, and social work have dedicated research and resources in an attempt to arrest or reverse this alarming trend. Guided by existing gaps in contemporary research, this study expanded the knowledge base by examining the social and environmental determinants of childhood obesity for youths aged 13 to 17 year-olds. The social and environmental determinants of this research were guided by the Ecological Systems Theory and Social Capital Theory, and those determinants included academic development, medical access, social capital, and physical environment.

Using the 2007 – 2008 National Survey of Children's Health, a total of 30,097 youths aged 13 to 17 years were included in this study. Chi-square and logistic regression were used to test for associations between the demographic variables and their relationships to childhood obesity and to assess whether the independent variables were predictors of childhood obesity, respectively. Lastly, logistic regression was used to determine which of the four independent variables remained statistically significant when they were combined into the final model.

Of the different variables, academic development was the best predictor of childhood obesity. Consistent with existent literature, social capital, physical environment, and medical access were all statistically significantly correlated to childhood obesity. In addition, demographic characteristics such as minority status, male gender, and low socioeconomic status increased the risk for being obese. On the other hand, environmental protective factors that lowered the risk included presence of neighborhood playgrounds, walking paths, recreation centers, and community centers. In the final chapter, the significance of these findings is discussed as are the social work implications, limitations, recommended policies, and future research.

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CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 Statement of the Problem

For the past three decades, the prevalence of childhood obesity in the United States has more than doubled among children ages 2 to 5 years-old, tripled among 6 to 11 year-olds, and doubled in 12 to 19 years-old, bringing a total of over 9 million overweight youth (United States Health and Human Services, [HHS], 2010). In addition, an astounding 66% of adults in the United States are also overweight or obese (National Center for Health Statistics, [NCHS], 2007). If the momentum of the current obesity epidemic continues unabated, today's children may be the first generation in the history of United States to experience a shorter lifespan than their parents' (Olshansky et al., 2005). In the past, this rapid metastasis of obesity across genders, age groups, and ethnicities had masqueraded as a personal nuisance and cosmetic insubordination, but it has evolved into a social burden by inflicting maladies to economic establishments and community well-being and by violating the health and emotional essence of individuals and families (Acs & Lyles, 2007; Lufiyya, Garcia, Dankwa, Young, & Lipsky, 2008). Therefore, the general population, social scientists, health activists, and policy makers can no longer ensconce childhood obesity with reticent solicitude or merely remediate its extrinsic manifestations, but instead must address this problem by disrupting its infrastructure and sabotaging its underpinnings.

1.2 Consequences of Childhood Obesity

Repercussions of childhood obesity include hypertension, diabetes, sleep apnea, and respiratory and musculoskeletal diseases (Centers for Disease Control [CDC], 2007; Lufiyya et

al., 2008; Must & Strauss, 1999), medical conditions not commonly experienced by children decades ago but recognized as an emerging trend by pediatricians (Rosenbloom, Joe, Young, & Winter, 1999). Chronic cardiovascular risk factors seen mostly in adults in the past decades, such as elevated blood pressure, hyperlipidemia, and hyperinsulinemia, now occur in more than 60% of the overweight youth (Freeman et al., 2005). As a consequence of obesity, a 10 year-old child with type II diabetes can expect a shortened life expectancy of approximately 15 to 25 years (Winterfield, 2005). Furthermore, a negative relationship between chronic illnesses of obesity and quality-of-life has been reported by Schwimmer, Burwinkle, and Varni (2003), who stated that the impairment of physical, psychological, emotional, school, and social functioning of an obese youth was five times that of one who is not obese—a figure that is comparable to children and adolescents undergoing chemotherapy.

In addition to medical problems, childhood obesity correlates with psychosocial risks and precipitates behavioral problems for those afflicted (Haas et al., 2003; Jain et al., 2001; Murnan, Price, Tellijohann, Dake, & Boardley, 2006). Common psychosocial consequences of being overweight include schoolyard taunts, social discrimination, poor self-esteem, and depressive symptoms (Mahoney, Lord, & Carryl, 2005; McFarland et al., 2009; Must, 1996). Compared to children with normal weight, obese children experience more bullying (Pearce, Boergers, & Prinstein, 2002), rejection and isolation (Baum & Foreman, 1984; Strauss, Smith, Frame, & Foremen, 1985), and less friends and social interactions (Strauss & Pollack, 2003). In a study by Zellar et al. (2006), an estimated 30% to 45% of severely obese youth suffer from psychological problems as a result of their physical appearance. Other studies have shown that children express negative attitudes toward their obese peers as early as kindergarten, and that children prefer a playmate bound to a wheelchair or disabled by a major physical handicap than to one who is obese (Moran, 1999; Schwimmer et al., 2003). While a physical disability invokes a sense of sympathy and support that appeases its victims, obesity incites the opposite: Obesity often

carries an assumption of laziness and irresponsibility that stigmatizes those with the problem, relegating them to marginalization and mistreatment by their peers (Haines & Neumark-Sztainer, 2009).

Problems with childhood obesity often persist into adulthood, with an estimated 42-75% of overweight children becoming obese adults (Murnan, Price, Tellijohann, Dake, & Boardley, 2006; Freeman et al., 2005). When obese children become obese adults, their underlying medical conditions foster secondary, recalcitrant, and expensive-to-treat complications such as renal failure, retinopathy, stroke, myocardial infarction, cardiovascular disease, and orthopedic problems (Haas et al., 2003; Hannon, Rao, & Arslanian, 2005; Urrutia-Rojas et al., 2008). In addition, obese adults correlate with fewer years of education, decreased likelihood of being married, lower household income (Haas et al., 2003), increased occupational injuries (Bhattacherjee et al., 2003), higher absentee days from work (Aldana & Pronk, 2001; Tucker & Friedman, 1998), and higher medical costs and greater health care utilization (Pronk, Tan, & O'Connor, 2009). Therefore, obesity violates not only a person's physical and psychological well-being, but also disrupts a society's economical and infrastructural development (Li & Hooker, 2010), leading to annual direct and indirect costs to society that hovers at an estimated $139 to $163 billion (Finkelstein, Ruhm, & Kosa, 2005; Rogers, 2003).

Health costs and medical insurance account for a significant portion of the $139 to $163 billion (Finkelstein, Fiebelkorn, & Wang, 2003; Finkelstein, Ruhm et al., 2005). Yet, this figure may underestimate costs because 45 million people in the United States lack health insurance (Acs & Lyles, 2007), and their disadvantaged status deprives them of prevention and treatment of obesity, thereby artificially lowering an accurate monetary estimation. In the studies that have examined medical insurance and costs and obesity, obese people correlate linearly with utilization of medical service and medical expenses, incurring expenses significantly higher than non-obese people (Burton, Chen, Schlutz, & Edington, 1999; Finkelstein, Fiebelkorn, et al.,

2003; Finkelstein, Ruhm, et al., 2005). For example, Finkelstein, Fiebelkorn, et al. (2003) estimated that obese people spend an average of $732 to $1,486 per year higher on medical related expenses, an amount that is approximately 42% to 64% higher than people of normal weight. With the distinction of providing insurance coverage for the highest percentage of obese people compared to other health insurance plans, Medicare and Medicaid cost taxpayers an extra $350 per year just for obesity related expenses (Finkelstein, Fiebelkorn, et al., 2003). Despite the added expenses associated with health and insurance costs, the extra financial burden functions only to maintain, not necessarily to improve, the health status of the obese.

1.3 Importance to Social Work

Childhood obesity, generally categorized as a health issue, encroaches upon the realm of social work because it undermines the growth of human and social capital by engendering chronic debilitative illnesses, exacerbating fragile health and behavioral conditions, and intensifying already skyrocketing health care costs, all of which encumber the interaction and economics of productive community projects and social networking (Acs & Lyles, 2007). While social capital emanates from interpersonal connections with the community, and human capital derives from investments in people's skills, education, and health, childhood obesity blights these capacities by handicapping children's physical and emotional well-being and by weltering them into stigmatization and isolation. To mitigate this propensity, principles germane to social work are needed to unravel the childhood obesity genesis and to establish its denouement. Those social work principles comprise elements such as advocacy, cultural competence, socioeconomic justice, community education, and diversity awareness (Eliadis, 2006). Pursuing social justice in the health arena entails a responsibility in eliminating disparities in, coordinating with, and championing for health opportunities of children suffering from obesity.

Childhood obesity has been chronicled in numerous publications, with articles and research in disciplines such as medicine, law, social policy, children's development, nursing,

economics, psychology, and social work (Acs & Lyles, 2007; Burdette & Whitaker, 2003; Freeman, 2007; Haas et al., 2003; Mushi-Brunt et al., 2007; NCHS, 2008). While a commonality of purpose exists among the disciplines, a lack of teamwork has hampered a noteworthy effort in thwarting childhood obesity. Social work research and practice can braid together the interdisciplinary scholarships that often overlook the socioeconomic inequalities and institutionalized elements that contribute to this disease. According to the National Association of Social Workers' *Code of Ethics* (NASW, 2008), social workers should advocate equal treatment and social justice for individuals regardless of socioeconomic status, age, or ethnicity. With obesity's propensity to violate children with low socioeconomic status (Acs & Lyles, 2007; Freeman, 2007), and these children and their parent's pretermission to this silent transgression, social workers carry a duty to intervene upon these individuals and their families on a micro level, and to advocate for and engage in structural and policy changes regarding childhood obesity on a macro level.

Macro and micro conventions merge institutional and cultural practices with individual habituations, leading to a childhood obesity tribulation that is buttressed by contemporary social evolution and eternalized by a vernacular context (Fuentes-Afflick & Hessol, 2008; Keating & Hertzman, 1999). Social evolutions in the last three decades include the proliferation of fast-food restaurants (Freeman, 2007; Black & Macinko, 2007), commercialization of vending machines and snacks in schools (Murphy & Polivka, 2007), marginalization of school physical activities (Acs & Lyles, 2007; Fisher, 2006; Murphy & Polivka, 2007), and inundation of food-related advertisements through ethnic media channels (Hudson, 2008; Kean & Prividera, 2007). While many actors that contribute to the childhood obesity epidemic may resist a change of the status quo, social workers can unravel the social fabric where this status quo exists and mitigate the modernization and macro level developments that assert its deleterious latent effects and exploit its youngest and most vulnerable population. Similarly, by intervening at a micro level, social

workers individualize deliverance of advocacy, and at the same time, empower children's and parent's volition to a healthier lifestyle, which in turn might lead to richer human and social capitals.

While isolated cases of childhood obesity do not affect human and social capital, an epidemic of this ailment destabilizes and devalues their currency, transmuting a health and cosmetic curiosity into a debilitating social burden with tentacles that extend into farthest corners of societal infrastructure, an infrastructure that incubates obesity from social trends and evolution, but at the same time, clamors for a remedial commission. Interventional roles for social workers should include an ecological paradigm that interfaces individuals with an institutional, business, governmental, ethical, education, and cultural aspects of the childhood obesity problem. Childhood obesity has reached a critical juncture where its social burden not only demands the attention of health specialists, but also requires the interpositions of social workers.

CHAPTER 2

TERMS, THEORETICAL FRAMEWORK, AND LITERATURE REVIEW

2.1 Definition of Terms

Academic literature and the general media often use the term *childhood obesity* in a general sense, without a precise definition to apprise their audience of what the term signifies. In a qualitative sense, the term *childhood obesity* refers to a physical condition in which energy intake exceeds energy expenditure in an extended period of time, cumulating in storage of excess body fat that affects the body psychologically and physically (Blomquist & Bergstrom, 2007; Vieweg, Johnston, Lanier, Fernandez, & Pandurangi, 2007). Quantitatively, most researchers use the definition by Centers for Disease Control (CDC, 2009), which defines *childhood obesity* as a Body Mass Index (BMI) equal to or above the 95th percentile and *overweight* as a BMI from 85th to less than 95th percentile. Prior to 2009, CDC avoided the term *childhood obesity* because of potential stigmatization of labeling children as obese; instead, they used *overweight* for children whose BMI is at or above the 95th percentile and *at risk for overweight* for those whose BMI is from 85th to less than 95th percentile. This recent change in nomenclature has caused confusion when researchers reviewed contemporary literature concerning childhood obesity and its relationship to BMI.

BMI is formulated from a child's height and weight using a mathematic equation, with the resultant number plotted into standard growth charts which determine his or her BMI percentile (CDC, 2009). While BMI as a measurement tool falls short of being perfect, scholars in various disciplines have used it as a measure of childhood obesity. Other methods of measuring obesity exist, such as waist-to-hip ratios, bioelectric impedance, and skin-fold calipers, but BMI has

maintained a stalwart role in clinical and academic discourses of childhood obesity because of its reliability, ease of measurement, and practicality (Blomquist & Bergstrom, 2007). In addition, some authors, such as Cole, Bellizzi, Flegal, and Dietz (2000), called BMI the “gold standard” in the measurement of childhood obesity.

For the purpose of this dissertation, the terms *overweight* and *childhood obesity* were used interchangeably and categorized as BMI at or above the 85th percentile. Although BMI has been a useful tool to differentiate those between the 85th to 95th percentile and those at or above the 95th percentile, this differentiation has served more as a guide for the medical establishment in diagnosis and interventions than for exploration of social pathology as it relates to childhood obesity. According to the American Obesity Association (AOA, 2005), BMI in the 95th percentile and above is important partly because of its association with increased risks of diseases, its need for in-depth medical assessment, and its identification with a significant likelihood of adult obesity. Therefore, since this dissertation was focused on the sociological variables of childhood obesity and not just the medical aspects, a compression of the BMI at 85th to 95th percentile and at or above the 95th percentile into one category might avoid unnecessarily complicated analysis and at the same time, might provide a more succinct and lucid discussion of childhood obesity as a social pathology.

2.2 Theoretical Framework

2.2.1. Social Capital

Social scientists have long expounded upon the theory of social capital and their application in educational, employment, and economic settings, but only a few extant articles have addressed this theory in childhood obesity. Social capital refers to the social networks, civic engagements, formal and informal structures, interpersonal trust, and norms of reciprocity and mutual aid that facilitate individual and collective actions in a community (Halpren, 2005; Veenstra et al., 2004). While different theorists have described social capital, this theory is

mostly associated with Pierre Bourdieu and Robert Putnam (Dominguez & Arford, 2010). Bourdieu (1983) defined social capital as "the total aggregate of the actual or potential resources which are linked to possession of a durable network of mutual acquaintance or recognition" (p. 248), whereas Putnam (2000) defined it as "connections among individuals—social networks and norms of reciprocity and trustworthiness that arise from them" (p. 19). While Bourdieu's definition focused on resources, Putnam emphasized social connections, but both definitions stressed the existence of a network of people that induces an accruement of either resources or social connections, an accruement termed social capital.

Social capital affects childhood obesity by different mechanisms. Social capital can enhance an individual's attributes and activities by providing social support, supplying health care, exerting peer influence, encouraging social engagement, and sustaining interpersonal bonding (Veenstra et al., 2004). Tight knitting of this social fabric strengthens cohesion in the community, which in turn compels community members' to reciprocate support for one another and galvanize them to trust and to cooperate with one another, endeavors that often incarnate into civic participation, sports activities, or volunteer work (Halpren, 2005). In communities where such dynamics prevail, studies have shown that individuals' physical activities increase, and obesity prevalence plateaus (Cohen, Finch, Bower, & Sastry, 2006; Holtgrave & Crosby, 2006; Lindstrom, Moghaddassi, & Merlo, 2003). As the bonding among community members strengthens, the degree of social isolation diminishes, and a diffusion of knowledge concerning health promotion, coupled with an obligation for salutary behavior norms, influences individuals' choices in a positive and collective manner and beckons them to respect and support each other's social transactions mutually.

For example, in a community with high social capital among individuals and families, positive and collective actions that affect childhood obesity may be that adults create sports leagues for children; monitor children's sedentary time, such as television viewing and computer

playing time; and discourage children from eating energy-dense and fatty type foods (Cohen et al., 2006). On the other hand, if the social cohesion in a community minimally exists, adults may elide those responsibilities or distant themselves from them, because community members may feel that such responsibilities intrude upon other people's children, lest that such actions may be misinterpreted as criticism or interposition of family conventions. In such communities, where the social interactions are perfunctory rather than substantial, individualism precludes a commonality of activities, values, and norms, often leading to avoidance of neighbors and withdrawal of children's physical and social activities, and culminating in children spending more time in sedentary indoor seclusion (Cohen et al., 2006). Through a social network of formal and informal means, collective resources embedded in communities can impact children's health, but without those resources, purposeful utilitarian actions that improve their well-being may not flourish as well as a community that possesses such social capital (Cohen et al., 2006; Kim et al., 2006; Lindstrom et al., 2003).

Despite the protective effects of social capital, Portes (1998) indicated that social capital can exert a negative influence on the community by the same mechanisms that produce the positive effects. For example, individuals in groups such as the Klu Klux Klan and the Mafia share similar values, hold a sense of identity, trust each other, and reciprocate for one another, but the detrimental nature of their collective resources discomposes communities and disrupts any progressive cadence. Extending that paradigm into a childhood obesity context, in a community where the adults provide an environment conducive for being overweight, such as social interactions that revolve around food or cultural norms that encourage a large physique, social capital may reinforce, rather than reduce, the prevalence of childhood obesity (Cohen et al., 2006; Holtgrave & Crosby, 2006). To illustrate this point, Christakis and Fowler (2007) examined a densely interconnected social network of 12,067 people over a 32 year period and found that a person's chance of becoming obese increase by 57% if he or she has a friend who

might also be obese. Christakis and Fowler suggested that obesity spreads in a quantifiable pattern, depending on the nature and intensity of the social networking, and posited that directional shifts in a community's overall body weight can be manipulated through a social network's acceptance or rejection of a body weight perceived as the norm or ideal.

In addition to influencing individuals' attributes and activities, social capital also affects childhood obesity indirectly through political, social, and environmental means (Veenestra et al., 2004). Political actions that alter public policies require a fraternal investment among its residents, an investment of social capital that stresses importance of community, sharing of responsibilities, and a commonality of values. Communities with high social capital and unity of purpose can mobilize its residents for political actions that neutralize public health threats such as obesity. This form of social capital, termed collective efficacy, refers to the capacity of a neighborhood to undertake collective action when a concern disquiets a community (Dominguez & Arford, 2010; Richardson & Norris, 2010). For example, through collective efficacy, community residents have succeeded in demanding health promotional goods and services for children, such as removing snack and soda vending machines from schools (Story, Nanney, & Schwartz, 2009) and subsidizing community centers and municipal associations to provide opportunities for children's physical activities (Kim et al., 2006).

Collective efficacy can also affect environmental determinants of childhood obesity. Collective efficacy, through political actions, can pressure for modification of neighborhoods into ones that promote physical activities. In neighborhoods with parks, recreational facilities, bike trails, and playgrounds, children spend more time engaged in outside activities, correlating with lower incidences of obesity (Dunton, Kaplan, Wolch, Jerrett, & Reynolds, 2009; Kim et al., 2006; Veugelers, Sithole, Zhang, & Muhajarine, 2008). On the other hand, children's outside activities and well-being can be undermined by an unsafe or impoverished environment that not only includes crime, but also of dense traffic, abandon buildings, and hazardous products

(Richardson & Norris, 2010; Veugelers et al., 2008). When parents perceive a neighborhood as unsafe, they tend to discourage children from unsupervised playtime and thereby predispose them to obesiogenic behaviors such as computer playing, television watching, or excessive eating (Black & Macinko, 2007; Cohen et al., 2005; Veenestra et al., 2004; Veugelers et al., 2008). While these relationships that affect childhood obesity may evolve from other confounding variables, social capital and neighborhood financial wealth augment each other in a synergistic manner and empower residents in such neighborhoods with better resources to attenuate potential health determinant derelictions (Veenestra et al., 2004).

Differentials of financial wealth stratify people and neighborhoods into different classes, widen social distance between them, and cultivate disparities in health. Disparities in health, such as childhood obesity, derive partly from differentials in social status and neighborhood socioeconomic factors (Grow et al., 2010; Haas et al., 2003; Palloni, Milesi, White, & Turner, 2009). Although the social capital of an interconnected network benefit the residents within such a network, residents of different socioeconomic status (SES) may experience difficulty penetrating into the networks of a different socioeconomic stratum and subsequently relegating them to rehash the same information and resources within the same network. Keating and Hertzman (1999) described this as the *gradient effect*, in which the size of the social distance varies directly with the disparities in health. Keating and Hertzman argued that while this *gradient effect* is partitioned by SES, it extends beyond financial means. They suggested that after a certain level of income has been surpassed, increasing prosperity fails to produce meaningful health gains, and other mechanisms, such as differential access to health services or unequal treatment from health providers reinforces this disparity.

This health disparity may stem from a lack of bridging capital, defined as a form of social capital that connects different populations and crosses social classes (Laser & Leibowitz, 2009). When dissimilar social classes are able to form a link with one another, the link opens up

communication channels, disseminates information, cultivates trust, and diminishes inter-group suspicions. Often, the bridging of these weak links between population groups provides the greatest opportunities for new information and introduction to new resources (Dominguez & Arford, 2010). For people with obesity, who generally require more medical attention than people with normal weight (Burton, Chen, Schlutz, & Edington, 1999; Finkelstein, Fiebelkorn, et al., 2003; Finkelstein, Ruhm, et al., 2005), bridging capital in the form of health care access, medical insurance, and communication between health care providers may improve health outcomes, a point that is especially salient for minorities and people with low SES. For example, HHS's *2006 National Healthcare Disparities Report* (NHDR) stated that minorities were less likely to be informed or educated by their providers of their obesity status than Whites, and those with high school education were less likely to be informed than college educated. Furthermore, the NHDR reported that providers told only 37% of obese children of their weight status, and health practitioners' counseling for children's fitness correlated directly to their parent's income level.

Finally, social capital develops and empowers community capacity, especially for neighborhoods that lack resources and recycle outdated information (Dominguez & Arford, 2010). Community capacity includes fitness related interactions and civic projects that increase social capital available for their neighborhood, and by providing a fun and safe environment for people that participates, the community may generate a behavioral ethos that become shared norms for the children in the neighborhood. People without adequate access to health related services and activities lack a bridging capital, a lack that imprisons and preserves them in an unhealthy state where obesity and its related illnesses thrive and disproportionately prostrate its most vulnerable members (Acs & Lyles, 2007; Candib, 2007). Capital deficits create health disparities for youth, and the arrest or reversal or this deficit challenges the empowering providence of social workers.

2.2.2. Ecological Systems Theory

Interconnections among individuals, families, and communities extend beyond social capital and into the realm of Ecological Systems Theory (EST). Instead of a linear, cause-and-effect theoretical framework, EST conceptualizes dynamic and evolving interactions between individuals and ecological environments where small changes may lead to massive and unpredictable developments (Bronfenbrenner, 1979). These developments stem from a relational perspective, a perspective that includes an ecological niche where individual characteristics evolve not only by proximal elements, such as family, school, places of employment, and acquaintances, but also by a larger social context in which the proximal elements are embedded (Bronfenbrenner, 1979; Davison & Birch, 2001). For example, a child can develop obesity from the exchanges of proximal elements, which in turn interact with the characteristics and norms of the community, forming a circular process that links, reciprocates, and shapes the behavior of individuals with expressions of community. Therefore, EST rejects the reductionistic "eat less and exercise more" school of thought, which only embellishes a lack of responsibility for the obese, but instead delves beyond the singular setting and argues for a perspective that acknowledges different levels of ecological interactions.

According to EST, childhood obesity develops from five different levels of interactions: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Bronfenbrenner (1979) defined the microsystem as a pattern of relationships experienced by a person in a given setting; the mesosystem as the interrelationships among two or more settings in which the person actively participates; the exosystem as the settings that the person does not actively participate in but affects the other systems; the macrosystem as the system that encompasses all the other systems; and the chronosystem as differences in time experienced by individuals and families. The smaller systems are geometrically nested in layers within the larger systems, each contained inside the next larger systems, mutually exchanging, restructuring, and

accommodating with the system next to it—a bilateral process known as reciprocity. Through reciprocity, developmental processes among the systems adapt to and influence each other, an interactive transformation that can emanate from inner systems that otherwise have no presence in the outer systems and vice versa (Bronfenbrenner, 1979).

Nested in the innermost sanctum of all the different systems, a microsystem includes biological characteristics such as age, gender, ethnicity, and family predisposition to weigh gain as well as important figures such as parents, teachers, classmates, and siblings. In a microsystem, children shape their growth through a pattern of roles, activities, and relationships that instill meaning to them and develop their behaviors in settings that engage in face-to-face interactions (Bronfenbrenner, 1979). Within this system, children's dietary habits and activity levels can be shaped by parents and peers (Byrd-Williams, Kelly, Davis, Spruijt-Metz, & Goran, 2007; Kean & Prividera, 2007). In addition, research has indicated that by associating with others who acquiesce themselves with obesity, people can develop not only a tolerance for obesity (Christakis & Fowler, 2007), but also a preference (Greenberg & LaPorte, 1996).

For example, Greenberg and Laport (1996) reported that some ethnicities, such as African-Americans and Latinos, are more likely to prefer a fuller body silhouette and to view thinness as a negative attribute. Within such microsystems, when children identify with the attitudes of such parents or adult figures and then imitate their behaviors and food preferences, they adopt practices that place them at risk of obesity, perpetuating the communal lineage of obesity. In another study, Birch and Marlin (1982) suggested that parents act as role models for children's eating behavior, and children develop a preference for certain types of food through repeated exposures and learn to like dietary items that their parents ingest. By developing a food preference for energy dense comestibles, children in that microsystem may urge their parents to buy certain types of foods, and since the requested foods comprise the same types that the parents favor, it begets a circular process of parenting practices, children's eating behavior, and

children's weight status that sustain obesity (Byrd-Williams et al., 2007; Davison & Birch, 2001; Kean & Prividera, 2007).

While the microsystem is concerned with bilateral relationships between an individual and others within a setting, a mesosystem is concerned with the interactions across the settings in which the individual actively participates (Bronfenbrenner, 1979). For example, if a child studies in a school, resides in a family, and receives medical attention in a medical office, the mesosystem comprises the interactions between the school and family, school and medical office, family and medical office, etc. These networks serve vital social functions: transmission of resources, information, and attitudes from one setting to another and establishment of a power balance response on behalf of a child (Bronfenbrenner, 1979). Such joint interactions often generate an enduring impression in the developing child and persist even when the participant egresses out of the settings. On the other hand, when family circumstances deprive a child of certain settings, such as medical access, not only does the child loses the benefits of that setting but also the development of mutual trust and orientation for individuals within that missing setting (Bronfenbrenner, 1979).

A missing setting that affects many obese children is health provider access and medical insurance (Grow et al., 2010; Haas et al., 2003; Vieweg et al., 2007). This deficiency addles the developmental processes within a mesosystem, because obese children generally require more medical attention than non-obese children (Burton et al., 1999; Finkelstein, Fiebelkorn, et al., 2003; Finkelstein, Ruhm, et al., 2005), manifesting as more clinic visits, hospital admissions, and medication usage (Hering, Pritsker, Gonchar, & Pillar, 2009). When obese children lack medical insurance, it leads to a form of deprivation amplification, a process by which disadvantaged structural attributes amplify disadvantaged individual characteristics (Macintyre, 2007). In some instances that amplify disadvantaged characteristics, the settings between the mesosystems may not be missing, but the link between them may be weak. An example of a weak link would

be the discordant communication between parents and health care providers. Kial (1992) had suggested that populations with low SES cannot efficaciously communicate with their health care provider or understand the importance of preventive care or rehabilitative treatment, subjecting such groups to substandard outcomes even if health care providers properly convey the message to them. Therefore, while a missing setting within a mesosystem can impede the development of a child, especially for one burdened with disadvantaged characteristics, a weak linkage procures the same results by minimizing trust and communication between the settings.

The third component in EST consists of the exosystem; it refers to the social settings that extend beyond the child's immediate participation, but nevertheless affects his or her cognitive experiences and developmental landscape. According to Bronfenbrenner (1979), a child's exosystem can include settings such as the parent's place of employment, activities of the local community, and the neighborhood surroundings. Although these settings appear quite isolated from a child, they exert significant influence because power differentials and major decisions made in those settings can rearrange the dynamics of the ecological terrain and confound the developmental processes of children. For example, if parents' places of employment (exosystem) fail to provide medical insurance, it affects their children's access to a medical provider (mesosystem), which in turn influences the activities and roles (microsystem) that children play within their settings, especially if a child carries a chronic illness such as obesity. This interplay is bidirectional, but it highlights the importance of a power differential in the exosystem in which the efforts of those acting on the behalf on a child can be undermined by a more influential setting (Bronfenbrenner, 1979).

Other influential settings in children's exosystem include neighborhood organizations and government entities. These settings affect children's development because of their decision making practices in societal trends, fiscal constraints, public policies, and social burdens (Lang & Rayner, 2006). In the ecological framework, decisions adjured by government officials and

community leaders often act unintentionally as distal meditating factors in the progression of childhood obesity. When school administrators endorse vending machines and junk foods in school cafeterias in order to subsidize revenues; curtail time for physical education in favor of academic focus; and serve inexpensive but energy-dense food products to children in order to retrain costs; school officials preoccupy themselves with administrative pragmatism, but in the process, promote the burgeoning obesity epidemic (Acs & Lyles, 2007; Story et al., 2009). Likewise, when community leaders design neighborhoods without parks, sidewalks, or amenities for recreational activities, children tend to stay indoors and immerse themselves in sedentary behaviors (Black & Macinko, 2007; Dunton et al., 2009; Veugelers et al., 2008). Thus, the exosystem wields considerable influence on children obesity, since decisions made and carried out without children's participation affect their health and development within this setting.

The fourth component in EST, the macrosystem, comprises cultural values, customs, and patterns in which all the other systems establish their concrete manifestations. Cultural ideologies stemming from the macrosystem cascade into the different systems and vice versa, with relational isomorphism at different levels of the ecological structure (Bronfenbrenner, 1979). In the United States, studies have suggested that cultural conventions reinforce childhood obesity in Latino and African-American populations (Burnet et al., 2007; Duerksen et al., 2007; Reifnider et al., 2006; Snethen, Heweitt, & Petering, 2007). For example, Gore's (1999) study indicated that African-American women believed that norms of body weight focused on the dominant culture's view of beauty, and that weight charts perpetuated the notion that they were not beautiful, impelling them to overlook the medical definitions of obesity. Other researchers have indicated that African-American and Latino mothers thinks weight charts convey an unintended message that they foundered in their parenting skills, causing their children to become obese (Jain et al., 2001). In the Latino culture, Reifnider et al. (2006) reported that by

encouraging children to eat, Latino mothers believed that they promote children's happiness with satiety and demonstrated successful parenting by flaunting a heavier offspring.

The final component in EST is the chronosystem, which provides ways to understand differences in time as experienced not only by characteristics of individuals and families but also of the environment (Bronfenbrenner, 1979, 1994). Chronosystem encompasses internal and external characteristics in the development of individuals. While internal characteristics such as age, ethnicity, and culture may contribute to childhood obesity, external characteristics over the course of time can also play a role. Researchers have pointed out that external factors may play a role in the development of childhood obesity, such as SES (Hawks & Madanat, 2003; Lutfiyya et al., 2008; Haas et al., 2003) neighborhood factors (Franzini et al., 2009; Jones et al., 2009; Rahman, Cushing, & Jackson, 2011; Sallis & Glanz, 2009), medical access (Freeman et al., 2005; Hannon et al., 2005; Hering et al., 2009). When parents and children share these factors in time with others, the sharing bonds individuals in ways that give them special meaning. For example, in the case of childhood obesity, Black and Macinko (2007) reported that when a neighborhood has facilities for outdoor play, more children bonds with one another, leading to an increase in physical activities and a decrease in BMI.

2.3 Summary of Theoretical Framework

Social capital and EST incorporate a dynamic, emergent, and creative framework in explaining the infrastructure of childhood obesity. These two theories eschew the reductionistic approach that typifies experimental settings, but embrace the unpredictability and variability that prevail in social work and in naturalistic settings. When used together, these theories complement each other and provide a useful tool to address different factors of childhood factors. In the next section, a literature review of the different factors that shape childhood obesity is provided.

2.4 Literature Review

This literature review was conducted to examine childhood obesity in the context of social capital and EST. The first section of the review provides an overview of childhood obesity and its association with socioeconomic status. The second section expands upon the first section by exploring specific socioeconomic factors that affect childhood obesity, factors which entail medical care access, physical environments, academic achievements, and school participation.

In order to be included in the current literature review, studies had to be peer reviewed, empirically based, published within the last 10 years, and focused mainly on children. Articles older than 10 years were reviewed if they discovered to be classical studies or had been cited in numerous publications or textbooks. The data from this review was not limited to any specific demographics of individuals; the only common denominator for the individuals in this review was that they were children less than 18 years-old and fit the criteria for obesity. The data bases from which these articles were pulled included Academic Search Complete, Health Source, MEDLINE, psycARTICLES, psycINFO, JSTOR, Social Work Abstracts, textbooks, and interlibrary loans.

Search terms used included “child AND obesity,” “obesity,” “SES,” “child AND overweight,” “physical environment,” “academic achievement,” “school,” “school participation,” “quality-of-life,” “medical insurance,” “medical access,” “Medicaid,” “overweight,” “chronic illnesses,” “behavior problems,” and “socioeconomic status.” A combination of search terms was used to search for the articles and the reference sections of relevant articles were used to culled additional sources. From these articles, only the ones concerning the following measures were selected: SES, quality-of life, academic achievement, medical and behavior issues, school attendance, and physical environment. Only articles written in English were selected. Many studies cited in this review had major outcome measures that were not the measures of this

literature review. For those studies, their major outcome measures were either briefly mentioned or not at all. The factors for childhood obesity are complex and multi-faceted; therefore, this literature review was systemic, but not exhaustive. This review was conducted purposely to examine those factors not as well researched in the literature, which in turn formed the basis for this dissertation.

2.4.1 Socioeconomic Status

Numerous researchers documented the correlation of low socioeconomic status and childhood obesity (Hawks & Madanat, 2003; Hudson, Stotts, Pruett, & Cowan, 2005; James, Fowler-Brown, Raghunathan, & Van Hoewyk, 2006; Lutfiyya et al., 2008; Haas et al., 2003; Salsberry & Reagan, 2009). In addition to income levels, socioeconomic status encompasses educational achievement, marital standing, employment situation, and health care accessibility. While a lowered per capita income correlated with increased obesity in children (Haas et al., 2003; Hawks & Madanat, 2003; Salsberry & Reagan, 2009), researchers discerned different reasons for this inverse relationship. For example, people with higher income were connected to safer neighborhoods for exercise and were privy to gym memberships, privileges that increase physical fitness and decrease obesity (Burdett, Wadden, & Whitaker 2007; Lutfiyya et al., 2008). Other researchers suggested that people with low income can mainly afford inexpensive, energy dense, and calorie rich foods: fast foods, processed foods, and prepackaged foods that have been shown to have a positive correlation with increased BMI (Hawks & Madanat, 2003; Hudson et al., 2005; Urrutia-Rojas et al., 2008; Thompson et al., 2003). Also, living in an impoverished neighborhood increases the odds of being obese because of unsafe places to play, a perception of danger, decreased number of grocery stores that sell fresh foods and vegetables, and increased fast-food presence (Black & Macinko, 2007; Freeman, 2007; Hudson et al., 2005; Mushi-Brunt et al., 2007; Regan, Lee, Booth, & Smith, 2006; Zenk, Schulz, & Israel, 2005).

Similar to the negative relationship between income, education attainment of mothers also denotes an analogous relationship—lower education level correlates with increase childhood obesity (Dhoble, Patel, & Young, 2008; Strauss & Knight, 1999). Research had shown that lower maternal educational levels lead to decreased consumption, in their children, of healthy foods such as fruits and vegetables (Hudson et al., 2005; Mushi-Brunt et al., 2007), decreased physical activities, increased dietary intake of fats and high calorie foods (Kimm & Obarzanek, 2002), and increased pressure to overfeed (Crounch, O'Dea, & Battisti, 2007), unhealthy inclinations that originated from a lack of education and knowledge concerning nutrition and physical fitness (Bahr, 2007; Haas et al., 2003). Goodman, Slap, and Huang (2003) posited that a lack of maternal education may also affect childhood obesity by nescient coping style, communications, and personal skills when dealing with children.

Furthermore, children of women who are single, unemployed, and without health insurance face the highest risk of obesity (Bibeau, Moore, Caudill, & Topp, 2008; Haas et al., 2003; Hawks & Madanat, 2003). For example, Strauss and Knight (1999) followed 2,913 children over a 6-year period and found that highest incidences of childhood obesity prevailed in African-American children born to single, unemployed mothers who failed to complete high school. Unemployed and uninsured mothers lack access and resources for healthy children's diet and interventions needed for chronic illnesses such as obesity, relegate their children to the lower priced, low-nutrient, and high-calorie foods, and often ignore chronic medical conditions until it has reached a physically dysfunctional impasse (Caprio et al., 2008). Furthermore, for mothers without adequate insurance and education, navigation of the health care system to treat childhood obesity disconcerts them: Many health care providers and social workers alike view this disease as a personal responsibility and express little enthusiasm in helping them, often showing repulsiveness with a "blame the victim" mentality (Caprio et al., 2008).

2.4.2 Medical Access, Insurance, and Childhood Obesity

In the United States, people with medical insurance utilize more medical services and receive more preventive treatment than those without it (Fong & Franks, 2008). For obese children, access to medical care poses a special problem because numerous studies have indicated that they acquire more chronic illnesses and require more medical attention (CDC, 2007; Freeman et al., 2005; Hannon et al., 2005; Hering et al., 2009; Lufiyya et al., 2008; Must & Strauss, 1999; Urrutia-Rojas et al., 2008). For example, Hering et al. (2009) compared 362 obese children to 382 controls of normal weight over a two year period, and found that obese children incurred more clinic visits (4,943 vs. 4,058), subjected to more inpatient hospitalization (67 vs. 34), experienced longer hospitalization days (207 vs. 79 days), and takes more medications (5,945 vs. 4,638). Despite the increased need for medical attention, obese children are less likely to be covered by medical insurance (Haas et al., 2003; Vieweg et al., 2007). Lack of medical insurance, coupled with childhood obesity's propensity to affect people of low SES, compounds the hardships of children distressed by this ailment.

In the United Sates, where the mean household income in 2009 is $50,221 per year (U.S. Census, 2010) and the mean annual cost of medical insurance coverage for a family of four is $13,700 (Kaiser Foundation, 2010), even obese children in the mean household income range may not be able to afford preventive counseling or therapeutic treatment. Furthermore, for those who are unable to afford medical insurance and are enrolled in Medicaid or Children's Health Insurance Program (CHIP), only 10 states allowed reimbursement for obesity related nutritional and behavior therapy (Lee, Sheer, Lopez, & Rosenbaum, 2010). The other 40 states either have denied such coverage or denoted inconclusive guidelines regarding the reimbursement of obesity treatment (Lee et al., 2010). Therefore, while a lack of medical insurance may prevent an obese child from seeking treatment due to financial reasons, the

existence of insurance coverage does not necessarily guarantee treatment options from providers.

Not only does a lack of or inadequate medical access widen the health disparity gap and correlates with an increase in childhood obesity, but the categories of insurance—private or Medicaid also portend the obesity status of a child, partially imputing the SES element in child obesity development (Grow et al., 2010; Haas et al., 2003; Richardson & Norris, 2010).

For example, when Grow et al. (2010) examined the socioeconomic variables of 8,616 children, ages 6 to 18 years-old, that were located in King County, Washington, they found that a higher proportion of obese children had enrolled in Medicaid (23%) than private insurance (15%). Similarly, when Haas et al. (2003) explored the relationship between childhood obesity and medical insurance status in a group of 6 to 17 years-old children, using data from the Medical Expenditure Panel Survey, they discovered the relationship mirrors that of SES: The uninsured had the highest positive correlation with childhood obesity, regardless of age groups; and the publicly insured were more likely to be obese than the privately insured, but only in the 12 to 17 years-old group and not the 6 to 11 years-old group. Haas et al. (2003) suggested that because younger children generally require immunizations and check-ups for school attendance, public and private insurance perform similar medical services for that age group, assessing and diagnosing problems on a regular basis, and therefore access to medical information and treatment should be analogous regardless of public or private insurance, leading to similar prevalence of obesity between public and private insurance in the younger group. On the other hand, the availability of public insurance becomes more restricted as children reach an older age, and this restriction constricts access to medical providers and prevents diagnosis or treatment of chronic problems such as obesity (Haas et al., 2003).

While the nuances of public and private insurance contribute to the disparities of childhood obesity, the uninsured obese child faces major barriers in accessing preventive or

therapeutic health care. For example, Richardson and Norris (2010) reported that the uninsured, when compared to those with insurance, are 3.9 times (35% versus 9%) more likely to ignore medical conditions, 3.25 times (13% versus 4%) more likely to not fill a prescription, 3.1 times (47% versus 15%) more likely to postpone care due to financial reasons, and 4.7 times (42% versus 9%) to have no regular source of care. Simply put, the uninsured tolerate poorer health status, initiate treatment at later stages of illness, and obtain less treatment than those with insurance (Richardson &Norris 2010). When viewed in that perspective, Haas et al. (2003) argued that private insurance has demonstrated a protective effect against childhood obesity through medical accessibility.

2.4.3 Physical Environments and Childhood Obesity

In the context of health, built environments such as bike trails, parks, recreational facilities, sidewalks, and playgrounds can provide a place for children to participate in physical activities. Numerous studies have documented the association between environmental surroundings and BMI (Black & Macinko, 2007; Davison & Birch, 2001; Dunton et al., 2009; Elder et al., 2010; Franzini et al., 2009; Jones et al., 2009; Rahman, Cushing, & Jackson, 2011; Sallis & Glanz, 2009; Slater et al., 2010). Of the articles reviewed, Elder et al. (2010) and Jones et al. (2009) found an association between physical environment and BMI. One of those two articles focused only on Latino children between kindergarten and second grade, in which the authors have indicated its limited generalizability due to ethnicity and age restrictions (Elder et al., 2010). The other article that failed to find an association between physical environment and BMI included a population of obese children whose SES was higher than those of the non-obese, and the authors suggested that the affluent environment of the obese children accounted for lack of association (Jones et al., 2009).

In the seven studies with inverse correlations between physical environment and BMI, five indicated that neighborhoods with parks, walking paths, or bicycle trails led to increased

physical activities of the study participants, which in turn led to a lower BMI (Black & Macinko, 2007; Franzini et al., 2009; Rahman, Cushing, & Jackson, 2011; Sallis & Glanz, 2009; Slater et al., 2010). The other two studies evaluated environmental determinants such as litter, trash, and noise (Dunton et al., 2009), and crime, availability of supermarkets, and neighborhood stores (Davison & Birch, 2001). Franzini et al. (2009) pointed out that physical environment correlated inversely with BMI, but occurred only in the presence of increased social cohesion, suggesting that social capital plays a role in the neighborhood. Slater et al. (2010) demonstrated that physical activities of youth was inversely related to the degree of physical disorder in the neighborhood, with physical disorder defined as presence of homeless people, dilapidated buildings, bars on sides of windows, and graffiti.

In a study which combined all of the elements discussed above, Veugelers et al. (2007) surveyed 5,471 fifth grade students and their parents. Veugelers et al. found that children with the highest access to supermarkets consumed more fruits and vegetables, ingested fewer fats, and correlated with a 33% less chance of becoming obese when compared to those with minimal access. In addition, when parks and recreational facilities were available in neighborhoods, children spent less time in front of a computer or in front of television relative to those in neighborhood with poor access. Finally, relative to unsafe neighborhoods, children whose neighborhood were perceived as safe by their parents spent more time in sports and other physical activities; however, while BMI and physical activities time were statistically significant, BMI and neighborhood safety were not (Veugelers et al., 2007).

2.4.4 Academic Achievement, School Participation, and Childhood Obesity

As an institution for children and society, schools provide more than just academic functions: Schools edify and empower children into productive, well-adjusted, and independent citizens. However, the social aspects of learning have percolated into a secondary role because of the United States' zeal for academic achievements as epitomized by the No Child Left Behind

policy, a policy that held schools accountable for children's academic achievement (Clark & Slate, 2009). One of the unintended consequences of this determination for minimal academic standards is that it constricts the time for physical fitness within the school systems because it maximizes academic endeavors and minimizes physical activities, leading to a recommended daily physical education curriculum that is followed by only 6% to 8% of the schools in the United States (Taras & Potts-Datema, 2005). The irony of minimizing physical activities in schools is that physically inactive youth tend to experience more chronic illnesses and become obese (Hering et al., 2009; McFarland et al., 2009; Schwimmer et al., 2003) and that physical activities benefit cognitive and behavioral functions which may improve academic achievements (Carlson et al., 2008; Ramstetter, Murray, &Garner, 2010; Taras & Potts-Datema, 2005).

Although no researchers have proven causality from physical activities to academic underachievement, numerous researchers have suggested an inverse relationship between them (Carlson et al., 2008; Clark & Slate, 2009; Dater & Strum, 2006; Hollar et al., 2010; Krukowski et al., 2009; Taras & Potts-Datema, 2005). Carlson et al. (2008) analyzed data from the Early Childhood Longitudinal Study to determine the relationship between the times spent in physical education and academic achievement. In their study, academic achievement scores of 5,316 children in kindergarten, first grade, third grade, and fifth grade were analyzed against minutes-per-week of physical activities in school. Carlson et al. stated that girls who were in the lowest minutes-per-week of physical activities consistently scored lowest in the achievements scores across the different grades in math, but with mixed results in reading. In their study, the relationship between physical activities and academic achievement was not significant for the boys. Carlson et al. suggested that increased time for physical fitness in schools did not harm academic achievement; instead, it may have a moderate favorable effect.

Dater and Strum (2006) used the same set of data from Early Childhood Longitudinal Study as Carlson et al. (2008), except that they examined the association between *changes* in

obesity status and academic scores between kindergarten and third grade. Their study showed that as a child progress from kindergarten to third grade and moving from non-obese status to obese status during that time was significantly associated with decreased academic achievement scores, increased absenteeism, and increased behavioral problems when compared to a similar child without the change in weight status. Increased absenteeism for obese children was also by Schwimmer et al. (2003). In their study of 105 obese children, when compared with a control group, obese children missed an average of 4.2 days of school per month while the control group missed an average of 0.7 days of school per month.

In another large scale study, Krukowski et al. (2009) compared the school performance and teasing experiences of 1,071 obese and normal weight children from pre-kindergarten to tenth grade. Krukowski et al. reported that BMI status was not a significant predictor of school performance in middle school children, but normal weight children in elementary schools fared much better than obese children. However, Krukowski et al. showed that when weight-based teasing was involved, the children who were teased were 50% less likely to have good school performance when compared to those who were not teased. Once again, Krulowski et al. showed that girls were more sensitive to the negative effects of obesity than boys. Krulowski et al. suggested that psychosocial variables stigmatize girls more than boys, accounting for the difference between girls and boys.

In an intervention study, Hollar et al. (2010) assessed the effects of a school-based obesity prevention program and its association with academic performance. For the 4,588 children involved in the study, the program offered nutritional education, dietary intervention during breakfast and lunch, and daily physical activity, while the children's parents received nutritional education only. At baseline, math and reading scores reveal no statistical significance between the control group (math: 279.2; reading: 282.9) and the intervention group (math: 285.6; reading: 286.7). At the end of 2 years, the intervention group scored much high in math then the

control group (307.9 versus 276.2), but less so for reading (292.4 versus 281.7). Hollar et al.'s results were statistically significant for math but not for reading. Schwimmer et al. (2003) and Clark and Slate (2009) attributed academic differences between obese and non-obese children partly to absenteeism and psychosocial variables that may cause the absenteeism (e.g., taunting and low self-esteem).

2.5 Purpose of the Study

The purpose of this study was to expand the body of knowledge concerning childhood obesity using the 2007 National Survey of Children's Health (NSCH). By exploring previously uninvestigated socioeconomic factors that might influence childhood obesity and integrating those factors into social work scholarship, the results of this cross-sectional study provided insight and identify attributes for the childhood obesity infrastructure.

2.6 Research Questions

The following questions were answered during this study:

1. Does academic development, as measured by participation of school activities, affect childhood obesity?
2. Does social capital, as measured by relationships to the community, affect childhood obesity?
3. Does the physical environment, as measured by neighborhood characteristics, affect childhood obesity?
4. Does medical issues, as measured by illnesses and access to care, affect childhood obesity?

CHAPTER 3

METHODOLOGY

3.1 Introduction

The National Survey of Children's Health (NSCH), a cross-sectional national survey sponsored by the United States HHS's Maternal and Child Health Bureau (MCHB) and conducted by National Center for Health Statistics of the CDC (NSCH, 2011), were used for this study. The primary purpose of NSCH was to gather state and national level data about health and health-related experience of children and youth in the United States (NSCH, 2011). Data from the survey have been used by MCHB to assess strategic health goals and to measure national health performance, including health-related indicators. The first administration of the survey took place in 2003 – 2004, and the second administration occurred in 2007 – 2008.For the purposes of this dissertation, the data obtained from the 2007 – 2008 survey was used.

3.1.1 Instrumentation and Database Development

The NSCH survey was designed by a National Expert Panel (NEP) that consisted of MCHB program directors, child health services researchers, representatives of family organizations, and survey design experts (NSCH, 2011). In designing the survey, the NEP conducted meetings, reviewed existing national surveys, and evaluated inputs from its members over a 15 month period of time. Once the questionnaire was drafted, the NEP sent it to be reviewed by outside experts and selected community members of potential data users. Comments about the survey were solicited from different agencies and assessed. The MCHB management made the final decision on what to include in the questionnaire. The final product for the 2007 survey included 540 variables and covered 11 sections of information. The 11

sections included demographics, health and function status, health insurance coverage, health care access and utilization, primary care providers, early childhood, middle childhood, family function, parental function, neighborhood characteristics, and miscellaneous demographics not covered in the first section.

3.1.2 Sample Design

The NSCH relied on data from a random dialed-digit-dial survey of telephone phone numbers drawn from banks of 100 numbers using the same 3-digits area code and 3-digits prefix. In order to select representative samples of children less than 18 years of age, the NCHS set the target number of interviews for each of the 50 states at 1,700. Telephone numbers identified as business phone numbers or non-working numbers were removed from the call list prior to the execution of the survey. When interviewers made calls to the phone numbers, they screened for any children under the age of 18 living in the household and for residential status. If children under the age of 18 resided in that household, only one such child was randomly selected for collecting the NSCH survey information, regardless of how many children lived in that household. The person answering the survey had to be a parent or guardian of the child pertaining to the survey. The number of interviews finally conducted varied slightly from state to state, with a range of 1,725 to 1,932 interviews. A total of 91,642 interviews were conducted nationwide, and the results were weighted from state to state to ensure the database represented the proportion of children in each state.

3.1.3 Informed Consent and Confidentiality

In accordance with HHS regulations; the survey questionnaire, design, methodology, and execution were reviewed and approved by NSCH Research Review Ethics Board. A vigorous protocol by NSCH prevents the unauthorized disclosure of confidential information or data dissemination. Before each interview could begin, informed consent was obtained from the survey participant. Participants were informed of the survey risks, voluntary nature of the

interview, time duration of the interview, confidentiality, legislative authorization, and the ability to quit the interview at any time.

The current study was approved by the University of Texas at Arlington's (UTA) Institutional Review Board. The approval number provided by UTA for this study was IRB Protocol: 2011-0630.

3.1.4 Interview Methods

Before interviewers conducted any interviews, they were trained by a subcontractor specializing in conducting national telephone surveys. The training process included the following: explanation of the goals of the survey, the sponsors of surveys, what the survey expects to accomplish, the targets of the survey, the expected time frame of data collection, and the usage of computer aided systems. In addition to the didactics, the trainers conducted mock interviews, question-and-answer sessions, evaluations, and review exercises with the interviewers. All potential interviewers had to successfully complete the training program prior to conducting any surveys with any volunteers.

Interviewers conducted interviews and recorded responses with computer-assisted telephone interviewing (CATI), a software system that presents the questionnaire onscreen and saves the data in a survey data file for easy analysis, thereby reducing the time for processing and transferring data. The CATI program automatically guided the interviewers through the questionnaire, determined if the answers were within an acceptable range, and automatically routed the interviewer to the next appropriate question. The CATI program provided a degree of consistency and standardization for the large number of interviews being conducted.

3.1.5 Sampling Weight and Estimation Procedures

In this survey, NSCH aimed for a total of 1,700 children from each state. Each child was assigned a sampling weight in order to obtain population-based estimates. The adjustments on the sampling weights were based on multiple phone lines in households, base sampling weight,

and non-responses. The final adjusted weights of the samples were calculated to correspond to the number of children in each state, as determined by the U.S. Census Bureau.

3.2 Current Study

Although NSCH collected data for children from birth to 18 years of age, childhood obesity was examined in this proposed study for children of ages greater than or equal to 13 years old and less than 18 years old. The dissertation was focused on this age group for a number of reasons. First, since the majority of contemporary studies about childhood obesity were focused on elementary and middle-school age children (Carlson et al., 2008; Hollar et al., 2010; Hughes et al., 2007; Krukowski et al., 2009; Veugelers et al., 2007), analyses were needed evaluate the understudied 13 to 18 year old age group and to add another layer of knowledge about childhood obesity. Second, the data in the NSCH were parent or guardian-reported, and data reported in this fashion have shown to be more reliable for studying this age group than for studying younger children (HHS, 2007, as cited by Chen et al., 2010). Third, as the 13 to 18 year old age group transitions into early adulthood, in which obese youth will likely become obese adults (Murnan et al., 2006; Freeman et al., 2005), studies needed to be performed on this age group and the results might form the last bastion of health and fitness rectification before these children become adults. The NSCH population of children included 30,095 children in the group 13 to 18 years of age, with 22,379 (74.4%) as non-obese and 7,716 (25.6%) as obese.

The statistical power for this analysis was calculated to be greater than 0.99. Therefore, the probability of rejecting a false null hypothesis, or stated differently, accepting a true research hypothesis, was greater than 99%. The parameters used in calculating the statistical power included$\alpha = 0.01$, meaning the odds of statistical significance occurring due to chance only were less than or equal to 1% for a sample size of 30,095 children between the ages of 13 to 17 years and for seven predictor variables.

3.3 Variables

3.3.1 Dependent Variable

BMI was the dependent variable. In the original NSCH survey, the survey coded BMI into four different ordinal scales: underweight, healthy weigh, overweight, and obese. For this study, BMI was compressed and recoded into a dichotomous scale with "underweight" and "healthy weight" recoded as "non-obese," and "overweight" and "obese" were recoded as "obese". "Overweight" and "obese" were collapsed into a single category because "obese" pertains more to the medical aspects of obesity, and this dissertation focuses on the social science aspects. The recoding scheme is listed in Table 3.1.

Table 3.1 Recoding of Dependent Variable BMI

NSCH Coding for BMI	Recoding for BMI
1 = underweight: BMI < 5^{th} percentile 2 = healthy weight: 5^{th} percentile ≤ BMI < 85^{th} percentile	0 = nonobese: BMI < 85^{th} percentile
3 = overweight: 85^{th} percentile ≤ BMI < 95^{th} percentile 4 = obese: BMI ≥ 95^{th} percentile	1 = obese: BMI ≥ 85^{th} percentile

3.3.2 Independent Variables

This section introduces the independent variables to be used in the analysis. While childhood obesity is a multi-faceted problem with different factors contributing to its existence, the independent variables analyzed in this dissertation were used due to their relevance as presented in the literature review, hypotheses, and theoretical framework. Some of the variables

were recoded and compressed into scales for regression analysis while others were used directly from the NSCH format.

3.3.3 Demographic Variables

Demographic variables used in this study included children's ethnicity, age, gender, and parent's income status. These variables were used for descriptive statistics and the study of obesity between the different subpopulations.

3.3.4 Academic Developmental Risk Scale

The Academic Development Risk Scale was comprised of a set of four questions from the NSCH survey. Instead of focusing mainly on school grades, this scale was used to examine the capacity for academic achievements. The questions included whether the youth attended school regularly, how many days of school have been missed in the last year, whether the youth have ever been held back a grade, and whether the youth have health problems that required special classes. The NSCH's variables for "refused" and "don't know" were discarded due to less than 1% of the sample used those variables. Scores on the scale ranged from 0 to 4, with "0" as having lower academic risk development and "4" as higher academic developmental risk.

Of the four questions, only one item (i.e., days of school missed) was a scale level type question in the NSCH survey, and that item was recoded into a dichotomous variable. Missing less than 12 days of school was recoded into a "0," signifying lower academic developmental risk. Missing more than 12 days of school was recoded into a "1," signifying higher academic developmental risk. This cut-off point was consistent with the literature in which obese children missed 6.8 to 12.2 days of school per year (Datar & Strum, 2006; Geier et al., 2007). The scale and the recoding process are listed in Table 3.2.

Table 3.2 Academic Developmental Risk Scale

Survey Question	NSCH Coding	Recoding
Does your child's health conditions interfere with his/her ability to attend school on a regular basis? (Question 106)	0 = No 1 = Yes 6 = Don't Know	0 = No 1 = Yes
During the past twelve months, how many days did your child miss school? (Question 196)	An exact number	0 = less than twelve days 1 = 12 days or more
Since starting kindergarten, has your child repeated any grades? (Question 198)	0 = No 1 = Yes 6 = Don't Know 7 = Refuse	0 = No 1 = Yes
Does your child have a medical problem that requires special education or classes (Question 199)	0 = No 1 = Yes 6 = Don't Know 7 = Refuse	0 = No 1 = Yes

3.3.5 Social Capital Assessment Scale

The Social Capital Assessment Scale was used to assess the amount of social capital held by the youth using selected elements as described in the literature. The scale included five elements from the NSCH survey: (1) people helping each other, (2) people watching out for each other's children, (3) people counting on other people, (4) neighbors that I trust, and (5) feeling safe in the neighborhood. The variables from NSCH were recoded into a format suitable for statistical analysis. The recoding was necessary because some of the original codes were discarded. The discarded codes were the "don't knows" and "refused". The discarded codes were due to not enough samples using those codes to make the analysis meaningful. The scores on this scale ranged from 0 to 16, with "0" as low social capital and "16" as high social capital. The scale and the recoding process are listed in Table 3.3.

Table 3.3 Social Capital Scale

Survey Question	NSCH Coding	Recoding
People in this neighborhood help each other out(Question 267)	1 = definitely agree 2 = somewhat agree 3 = disagree 4 = definitely disagree 6 = don't know 7 = refused	1 = disagree 2 = somewhat agree 3 = definitely agree
We watch out for each other's children in this neighborhood.(Question 268)	1 = definitely agree 2 = somewhat agree 3 = disagree 4 = definitely disagree 6 = don't know 7 = refused	1 = disagree 2 = somewhat agree 3 = definitely agree
There are people I can count on in this neighborhood.(Question 269)	1 = definitely agree 2 = somewhat agree 3 = disagree 4 = definitely disagree 6 = don't know 7 = refused	0 = definitely disagree 1 = disagree 2 = somewhat agree 3 = definitely agree
If my child gets hurt playing outside or is scared, there are adults who I trust to help them. (Question 270)	1 = definitely agree 2 = somewhat agree 3 = disagree 4 = definitely disagree 6 = don't know 7 = refused	0 = definitely disagree 1 = disagree 2 = somewhat agree 3 = definitely agree
How often do you feel safe in your neighborhood? (Question 271)	1 = never 2 = sometimes 3 = usually 4 = always 6 = don't know 7 = refused	0 = never 1 = sometimes 2 = usually 4 = always

3.3.6 Physical Environment Scale

The Physical Environment Scale was used to assess factors in the environment that may contribute to childhood obesity. The six variables in the scale included elements described in the review of the current literature. The items were as follows: (1) sidewalks or walking paths,

(2) parks or playgrounds, (3) recreation centers, (4) garbage or litter collection, (5) rundown housing, and (6) presence of vandalism and graffiti. Scores on the scale ranged from 0 to 6, with "0" as environment not conducive to physical activities and "6" as environments conducive to physical activities. All of the variables were recoded, since some of the variables represented risk factors and some represented protective factors; the risk factor variables were reverse coded. The "don't knows" and "refused" were not used due to not enough samples using those codes to make the analysis meaningful. Table 3.4 summarizes the recoding format.

Table 3.4 Physical Environment Scale

Survey Question	NSCH Coding	Recoding
	Protective Factor Scale	
Do sidewalks and walking paths exist in your neighborhood? (Question 260)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = No 1 = Yes
Does parks and playground exist in your neighborhood? (Question 261)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = No 1 = Yes
Does a recreation center, community center, or boys and girls club exist in your neighborhood? (Question 262)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = No 1 = Yes
	Risk Factor Scale	
In your neighborhood, is there garbage or litter in the streets? (Question 264)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = Yes 1 = No
In your neighborhood, is there poor or dilapidated building?(Question 265)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = Yes 1 = No
In your neighborhood, is there vandalism such as broken house or graffiti?(Question 266)	0 = No 1 = Yes 6 = Don't Know 7 = Refused	0 = Yes 1 = No

3.3.7 Medical Accessibility Scale

The Medical Accessibility Scale was used to evaluate the accessibility of medical services. Six questions were used as follows: (1) whether the child has coverage of medical insurance, (2) whether there was a lack of medical coverage in the last 12 months, (3) whether the child has a personal physician, (4) whether health care has been delayed or not received, (5)

whether the level of communication between parents and health care providers was satisfactory, and (6) whether the health care providers spend enough time with the children and family. The recoding was necessary because the codings for “don’t know” and “refuse” were dropped due to insufficient sampling. The scale scores ranged from 0 to 11 with “0” as low medical access and “11” as high medical access. Table 3.5 summarizes the recoding format.

Table 3.5 Medical Utilization Scale

Survey Question	NSCH Coding	Recoding
Does your child have any kind of health care coverage, such as health insurance, HMOs, or Medicaid? (Question 114)	0 = No 1 = Yes 2 = Don’t Know 3 = Refused	0 = No 1 = Yes
During the past 12 months, has your child been without insurance coverage? (Question 116)	0 = No 1 = Yes 2 = Don’t Know 3 = Refused	0 = Yes 1 = No
Do you have one or more person whom you think of as a personal doctor or nurse? (Question 124)	1 = Yes, one person 2 = Yes, more than one person 3 = No 6 = Don’t Know 7 = Refused	0 = No 1 = Yes, one or more than one person
During the past 12 months, was there a time when your child needed health care but was delayed or not received? (Question 132)	0 = No 1 = Yes 2 = Don’t Know 3 = Refused	0 = Yes 1 = No
Are you very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied with the communications with your child’s doctors and health providers? (Question 142)	1 = Very Satisfied 2 = Somewhat Satisfied 3 = Somewhat Dissatisfied 4 = Very Dissatisfied 5 = No communications wanted or needed 6 = Don’t Know7 = Refused	0 = Very Dissatisfied 1 = Very Dissatisfied 2 = Somewhat Dissatisfied 3 = Somewhat Satisfied 4 = Very satisfied
During the past 12 months, do the doctors spend enough time with your child? (Question 145)	1 = Never 6 = Don’t Know 2 = Sometimes 7 = Refused 3 = Usually 4 = Always	0 = Never 1 = Sometimes 2 = Usually 3 = Always

3.4 Hypotheses

3.4.1 Hypothesis 1

Research Hypothesis 1: Ethnicity is a predictive factor of childhood obesity among children ages 13 to 17 years old.

Null Hypotheses 1: There is no relationship between ethnicity and childhood obesity among children ages 13 to 17 years old.

3.4.2 Hypothesis 2

Research Hypothesis 2: Gender is a predictive factor of childhood obesity among children ages 13 to 17 years old

Null Hypothesis 2: There is no relationship between gender and childhood obesity among children ages 13 to 17 years old.

3.4.3 Hypothesis 3

Research Hypothesis 3: SES is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypothesis 3: There is no relationship between SES and childhood obesity among children ages 13 to 17 years-old.

3.4.4 Hypothesis 4

Research Hypothesis 4: Academic development risk is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 4: Academic development risk is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

A two-step regression was performed on this hypothesis. The second step in this hypothesis depended on the outcome of the first three hypotheses. Essentially, a second regression was performed based on the statistical significance of ethnicity, gender, and SES, which were used as control variables.

3.4.5 Hypothesis 5

Research Hypothesis 5: Social capital is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 5: Social capital is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

A two-step regression was performed on this hypothesis. The second step in this hypothesis depended on the outcome of the first three hypotheses; that is, a second regression was performed based on the statistical significance of ethnicity, gender, and SES, which were used as control variables

3.4.6 Hypothesis 6

Research Hypothesis 6: Physical environment is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 6: Physical environment is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

A two-step regression was performed on this hypothesis. The second step in this hypothesis depended on the outcome of the first three hypotheses. Essentially, a second regression was performed based on the statistical significance of ethnicity, gender, and SES, which were used as control variables.

3.4.7 Hypothesis 7

Research Hypothesis 7: Medical access is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 7: Medical access is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

A two-step regression was performed on this hypothesis. The second step in this hypothesis depended on the outcome of the first three hypotheses. Essentially, a second

regression was performed based on the statistical significance of ethnicity, gender, and SES, which were used as control variables.

3.4.8 Hypothesis 8

Research Hypothesis: Of all the predictive factors, medical access is the best predictor of childhood obesity.

Null Hypothesis: Of all the predictive factors, there is no difference in the predictive effects of the different factors.

3.5 Data Analysis Strategy

The first part of the data analysis involved descriptive statistics. Means, frequencies, and ranges were selectively evaluated on demographic variables such as gender, ethnicity, and socioeconomic status. The descriptive data were summarized and used to communicate the most salient aspects of the survey data for the youth aged 13 to 18 years old.

The second part of the analysis required using Cronbach's alpha to determine the internal consistency, or reliability, for each of the calculated scales. Cronbach's alpha was used to measure how closely related are the items on the scales used in this dissertation. A coefficient of 0.7 or higher was considered acceptable in social science research (Tabachnick & Fidell, 2007). In addition, inter-item correlations were used to determine internal consistency. Inter-item correlation is generally used when the items in the scales have less 10 or less factors in it.

The third and final part of the data analysis included testing the hypotheses using logistic multiple regressions and adding controls for variables. The control variables were gender, ethnicity, and SES. Logistic regression was used because the dependent variable was dichotomous, and logistic regression required no statistical assumptions other than lack of multicollinearity between the independent variables (Tabachnick & Fidell, 2007). Logistic regression provided probabilities and odds ratios for the predictors' relationships with the

dependent variable (Tabachnick & Fidell, 2007). The relationship between BMI and the independent variables were assessed using odds ratios.

CHAPTER 4

DATA ANALYSIS AND RESULTS

The guiding research question for the data analysis was the following: What are the social and environmental determinants of childhood obesity? In order to answer this question, the data analysis plan of Chapter 3 was used, and this chapter presents the results of the analyses. Statistical Program for Social Sciences (SPSS) version 18 was used to analyze the data obtained from the 2007-2008 National Survey of Children's Health (NSCH).

The statistical evaluation was performed methodically, using sequential step-by-step analyses that built on and reflect upon the statistical analyses which preceded it. Statistical analyses performed but offered little or no value to the research questions were systematically excluded from this report. In this chapter, the following are presented: First, the demographics of the sample are described, including gender, ethnicity, age, SES, and obesity. Second, crosstab analysis was used to determine if a difference existed within the demographic variables and their relationship to BMI. Third, regression analyses were used to determine the predictive value of social capital, academic participation, medical access, and physical environment as it relates to children's BMI. Fourth, after controlling for gender, ethnicity, and SES, a second regression analysis was used to examine the predictive value of the factors listed previously. Finally, the single most predictive factor among the four factors are presented.

4.1 Description of the Sample

A total of 31,001 youths from the 50 states of the United States, ages 13 to 17 year-olds, were included in the sample for this study. The following is a breakdown of the demographics of its participants. The sample by gender was comprised of 16,235 males (52.4%) and 14,724

females (47.5%). The sample in this study included 21,803 White (71.6%), 3,158 Hispanic (10.4%), and 3,152 Black (10.3%) adolescents. The mean age for this group was 15.7 years old (SD = 0.783). Socioeconomic status distribution was categorized into two groups: at or below 150% poverty level (*n* = 4,746; 16.8% of sample) and above 150% poverty level (*n* = 23,506; 73.2% of the sample). The age range for this group was 13 to 17 year-olds. The mean age was 15.7 (SD = 0.78). The breakdown on the age groups were as follows: Age 13 (*n* = 5380, 17.4%); age 14 (*n* = 5861, 18.9%); age 15 (*n* = 6088, 19.6%); age 16 (*n* = 6720, 21.7%); age 17 (*n* = 6953, 22.4%). Non-obese and obese youth were categorized into two groups: non-obese as a BMI of less than the 85th percentile and obese as BMI greater than or above the 85th percentile. In this sample, there were 21,113 non-obese youth (73.2%) and 7716 obese youth (26.8%). Table 4.1 summarizes the demographic findings.

Table 4.1 Demographic Characteristics of the Sample

Descriptor	*n*	%
Gender		
Female	14,724	47.5
Male	16,235	52.4
Ethnicity		
Black	3,152	10.3
Hispanic	3,158	10.4
White	21,803	71.6
SES		
Below 150% FPL	4,746	16.8
Above 150% FPL	23,506	73.2
Age		
13	5,380	17.4
14	5,861	18.9
15	6,088	19.6
16	6,720	21.7
17	6,952	22.4
Obesity		
Non-obese	21,113	73.2
Obese	7,716	26.8

4.2 Description of Demographics

This section used crosstab analysis to determine whether a difference existed within the demographics variables and Obesity. The demographics variables are gender, ethnicity, age, and SES.

4.2.1 Obesity and Gender

Crosstab analysis using the chi-square test of association was used to detect differences between obesity and the two genders. Obesity was defined as BMI greater than or above the 85th percentile and non-obese as a BMI of less than the 85th percentile. Within the gender classification, the results of the chi-square analysis revealed that statistically significant difference existed in childhood obesity frequencies between males and females (X^2 = 306.617, *df* = 1, *p*< .001). Between males and females, a higher percentage of males (16.3%) was obese than females (10.5%) The results are shown in Table 4.2.

Table 4.2 Obesity Frequencies by Gender

Dependent Variable	Male		Female		Total	
	%	*n*	%	*n*	%	*n*
Non-obese	36.1	10,407	37.1	10,706	73.2	21,113
Obese	16.3	4,701	10.5	3,015	26.8	7,716
Total	52.4	15,108	47.6	13,721	100.0	28,829

Note. χ^2 = 306.617, *df*= 1, *p*< .001.

4.2.2 Obesity and Ethnicity

Chi-square test was used to determine whether a statistically significant difference existed between childhood obesity and different ethnicities. The analyses revealed that statistical significance existed between childhood obesity and the three different ethnicities (X^2= 400.41, *df*

= 1, $p < .001$). Among the three groups, African-Americans had the highest rate of obesity (38.8%), followed by Hispanic (34.3%) and Whites (23.8%). The results are shown in Table 4.3.

Table 4.3 Obesity by Ethnicity

Dependent Variable	White		Hispanic		African American	
	%	*n*	%	*n*	%	*n*
Non-obese	76.2	15,217	65.7	1,800	61.2	1,814
Obese	23.8	4,866	34.3	940	38.8	1,152
Total	100.0	20,483	100.0	2,740	100.0	2,966

Note. $\chi^2 = 400.41$, $df = 1$, $p < .001$.

4.2.3 Obesity and Poverty

Crosstab analysis was conducted to investigate whether a difference existed between childhood obesity and poverty levels, using poverty as at or below 150% of federal poverty levels. The analysis revealed that a statistically significance difference between childhood obesity and those living at or below 150% of federal poverty levels and those above that level ($X^2 = 369.05$, $df = 1$, $p < 0.001$). The group that was at or below 150% of federal poverty level had obesity rate of 38.7% ($n = 1664$), and the group that was above 150% of federal poverty rate had an obesity rate of 24.5% ($n = 5419$). The results are shown in Table 4.4.

Table 4.4 Obesity by Poverty Level

Dependent Variable	At or Below 150% of Federal Poverty Level		Above 150% of Federal Poverty Level	
	%	*n*	%	*n*
Non-obese	61.3	2,639	75.5	16,705
Obese	38.7	1,664	24.5	5,419
Total	100.0	4,303	100.0	22124

Note. $\chi^2 = 369.049$, $df = 1$, $p < 0.001$

4.2.4 Obesity and Age

Crosstab analysis using the chi-square test of association was used to detect differences between obesity and the different ages, the ages were from 13 to 17 years-old. Within the age classification, the results of the chi-square analysis revealed that statistically significant difference existed in childhood obesity frequencies among the age groups (X^2 = 117.03, *df* = 4, *p*< .001). The results showed that 13 years-old had the highest obesity rate 31.1% (*n*= 1533); 14 years-old were 28.8% (*n* = 1575), 15 years-old were 26.8% (*n*= 1529), 16 years-old were 25.7% (*n* = 1612), and 17 years-old were 22.7% (*n* = 1467). The results are shown in Table 4.5.

Table 4.5 Obesity by Age

	Non-obese		Obese		Total	
Age	%	*n*	%	*n*	%	*n*
13	68.9	3,393	31.1	1,533	100.0	4,926
14	71.2	3,891	28.8	1,575	100.0	5,466
15	73.2	4,183	26.8	1,529	100.0	5,712
16	74.3	4,653	25.7	1,612	100.0	6,265
17	77.3	4,993	22.7	1,467	100.0	6,460

Note. $\chi^2 = 117.03$, $df = 3$, $p < 0.001$.

4.3 Description of Independent Variables

The independent variables were social capital, physical environment, medical utilization, and academic development. In this section, the ratio-level independent variables are described and assessed.

4.3.1 Social Capital

Social capital was analyzed using a scale that asked the following questions: (1) Do people in this neighborhood help each other out? (2) Do people watch out for other's children in this neighborhood? (3) Are there people I can count on in this neighborhood? (3) If children gets hurt playing outside, are there adults that I can trust to help? (4) How often do I feel safe in this neighborhood? The scores ranged from "0" as low social capital and "16" as high social capital. The mean score for this scale was 12.47, indicating the social capital for this sample was moderately high. The Cronbach's alpha for this scale was 0.86. The inter-item correlation was 0.45.

4.3.2 Physical Environment

Physical Environment was analyzed was broken down into two separate scales: one examined protective factors of physical environments as it relates to obesity, and the other analyzed risk factors of physical environments as it relates to obesity. For the protective factors, the following questions were asked: (1) Do sidewalks or walking paths exist in your neighborhood? (2) Do parks or playgrounds exist in your neighborhood? (3) Do recreation center, community center, or Boys and Girls Club exist in your neighborhood? The scores ranged from "0" as low protective factors and "3" as high protective factors. The mean score for the physical environment scale was 2.10. The Cronbach's alpha for the protective factors scale was 0.60, the inter-item correlation was 0.25. For the risk factors, the following questions were asked: (1) Is there garage or litter in the streets of your neighborhood? (2) Is there poor or dilapidated buildings in your neighborhood? (3) Is there vandalism, such as broken house or graffiti, in your neighborhood? The scores ranged from "0" as low risk and "3" as high risk. The mean score was 0.381. The Cronbach's alpha for the risk factors scale was 0.55, the inter-item correlation was 0.26.

4.3.3 Medical Access

Instead of using a scale for medical access, individual questions were used for increased reliability. The following questions were asked and scored in this section: (1) During the past 12 months, was there a time when your child needed health care but it was delayed or not received? The scores ranged from "0" as "yes" and "1" as "no", and the mean score from the sample was 0.06. (2) Do you have a personal doctor or nurse? The scores ranged from "0" as "no" and "1" as "yes", and the mean score from the sample was 0.92. (3) What is your satisfaction level with communications with your child's doctor or health provider. The scores ranged from "0" as "very dissatisfied" to "4" as very satisfied", and the mean score from the sample was 3.67. (4) During the past 12 months, did the doctors spend enough time with your

child? The scores ranged from “0” as “never” and “3” as “always,” and the mean score from the sample was 2.34.

4.3.4 Academic Development Risk

Academic development risk was analyzed using a scale that asked the following questions: (1) Does your child’s health conditions interfere with his or her ability to attend school on a regular basis? (2) During the past 12 months, how many days did you child miss school? (3) Since starting kindergarten, has your child missed any grades? (4) Does your child have any medical problems that require special education or classes? The scores ranged from “0” as having low academic risk to “4” as high academic risk. The mean score for this sample was 0.75. Cronbach’s alpha for this scale was 0.45, and the inter-item correlation was 0.32. Table 4.6 summarizes the different derived variables.

Table 4.6 Descriptive Statistics for the Derived Scale Variables

Scale Variable	*n*	*M*	*SD*	Min	Max
Social Capital	29,950	12.47	2.768	0	15
Physical Environment					
Protective Factors	30,382	2.103	1.018	0	3
Risk Factors	30,612	0.381	0.726	0	3
Academic Development Risk	7,490	0.750	0.953	0	4

4.4 Hypotheses Testing

In this section, the results of hypotheses testing and relevant statistical data are presented. Depending on the hypothesis, different statistical models were used in obtaining the data.

4.4.1 Hypotheses 1

Research Hypothesis 1: Ethnicity is a predictive factor of childhood obesity among children ages 13 to 17 years old.

Null Hypothesis 1: There is no relationship between ethnicity and childhood obesity among children ages 13 to 17 years old.

According to the results of the chi-square analysis, the null hypothesis was rejected. The analyses revealed that statistical significance existed between childhood obesity and the three different ethnicities (χ^2= 400.41, *df* = 3, *p*< .001).The specific differences in childhood obesities among the ethnicities were African-Americans at 38.8%, Hispanics at 34.3%, and Whites at 23.8%.

4.4.2 Hypotheses 2

Research Hypothesis 2: Gender is a predictive factor of childhood obesity among children ages 13 to 17 years old

Null Hypothesis 2: There is no relationship between gender and childhood obesity among children ages 13 to 17 years old.

The results of the chi-square analysis rejected the null hypothesis; therefore, a statistically significant difference existed between obesity and the two genders (χ^2= 306.617, *df* = 1, *p*< .001). Between males and females, there existed a higher percentage of obese males (16.3%) than females (10.5%).

4.4.3 Hypotheses 3

Research Hypothesis 3: SES is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypothesis 3: There is no relationship between SES and childhood obesity among children ages 13 to 17 years-old.

The null hypothesis was rejected as a result of chi-square analysis. A statistically significant difference exist between childhood obesity and those living at or below 150% of federal poverty levels and those above that level (χ^2 = 369.049, *df* = 1, *p*< 0.001). The group that was at or below 150% of federal poverty level had obesity rate of 38.7%, and the group that was above 150% of federal poverty rate had an obesity rate of 24.5%.

4.4.4 Hypothesis 4

Research Hypothesis 4: Academic development risk is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypothesis 4: Academic development risk is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

The null hypothesis was rejected as a result of analysis by logistic regression. To determine the outcome of this hypothesis, a two-step statistical analysis was used. In the first step, gender, ethnicity, age, and SES represented the demographic variables thought to predict obesity. The logistic regression model for Step 1 was significant and these demographic variables contributed significantly to the Step 1 model. The Nagelkerke R^2 was .046 for the logistic model of the demographic variables, accounting for approximately 5% of the variance. See Table 4.7 for the resulting model.

Table 4.7 Regression Model for Obesity and Demographic Variables

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.486	.029	286.44	1	.000	0.615	0.582	0.651
Ethnicity	.155	.014	117.01	1	.000	1.167	1.135	1.201
Child Age	-.098	.010	94.71	1	.000	0.906	0.889	0.925
Poverty Level*	-.603	.036	278.03	1	.000	0.547	0.510	0.588
Constant	1.431	.164	76.34	1	.000	4.183		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

In Step 2, logistic regression model revealed that academic development risk increased the variance accounted for by both steps of the model to approximately 6% of the variance in childhood obesity, with a Nagelkerke R^2 of 0.06, Exp(β) = 1.26, and $p< 0.001$. Students with higher academic development risk showed 1.26 times greater likelihood of obesity than students with less academic development risk. See Table 4.8 for the results of this model.

Table 4.8 Regression Model for Obesity and Academic Development Risk

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.313	.056	31.361	1	.000	0.732	0.656	0.816
Ethnicity	.145	.029	25.347	1	.000	1.156	1.092	1.223
Child Age	-.090	.020	21.158	1	.000	0.913	0.879	0.949
Poverty Level*	-.529	.070	57.838	1	.000	0.589	0.514	0.675
Academic Risk Scale	.235	.029	67.045	1	.000	1.265	1.196	1.339
Constant	1.031	.315	10.740	1	.001	2.804		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

4.4.5 Hypothesis 5

Research Hypothesis 5: Social capital is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 5: Social capital is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

The null hypothesis was rejected as a result of analysis by logistic regression. To determine the outcome of this hypothesis, a two-step statistical analysis was used. In the first step, gender, ethnicity, age, and SES represented the demographic variables thought to predict obesity. As stated previously, the logistic regression model for Step 1 was significant and these demographic variables contributed significantly to the Step 1 model. The Nagelkerke R^2 was

.046 for the logistic model of the demographic variables, accounting for approximately 5% of the variance.

In Step 2, logistic regression model revealed that social capital increased the variance accounted for by both steps of the model to approximately 5% of the variance in childhood obesity, with a Nagelkerke R^2 of 0.05, Exp(β) = 0.96, and $p < 0.001$. Youth with higher social capital had a 0.96 higher chance of obesity than youths with lower social capital. See Table 4.9 for the results of this model.

Table 4.9 Regression Model for Obesity and Social Capital

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.495	.029	290.275	1	.000	0.610	0.576	0.645
Ethnicity	.142	.015	92.788	1	.000	1.152	1.119	1.186
Child Age	-.098	.010	92.291	1	.000	0.906	0.889	0.925
Poverty Level*	-.565	.037	228.310	1	.000	0.569	0.528	0.612
Social Capital Scale	-.035	.005	46.630	1	.000	0.966	0.956	0.975
Constant	1.868	.178	110.639	1	.000	6.473		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

4.4.6 Hypothesis 6

Research Hypothesis 6: Physical environment is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 6: Physical environment is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

The null hypothesis was rejected as a result of analysis by logistic regression. To determine the outcome of this hypothesis, a two-step statistical analysis was used. In the first step, gender, ethnicity, age, and SES represented the demographic variables thought to predict obesity. As stated previously, the logistic regression model for Step 1 was significant and these demographic variables contributed significantly to the Step 1 model. The Nagelkerke R^2 was .046 for the logistic model of the demographic variables, accounting for approximately5% of the variance.

The second step divided physical environment into two parts: protective factors and risk factors of childhood obesity. The Protective Factor Scale included environmental factors that serve a protective effect, such as sidewalks, walking paths, parks, playgrounds, recreation centers, or Boys and Girls Clubs. The Risk Factor Scale included environmental factors that serve a detrimental effect, such as presence of garbage, litter, graffiti, dilapidated buildings, or vandalism.

Logistic regression model revealed that physical environment increased the variance accounted for by both steps of the model to approximately 5% of the variance in childhood obesity, with a Nagelkerke R^2 of 0.05. Youth who lived in areas with environmental protective factors were 0.92 times as like to be obese, which were statistically significant with $\text{Exp}(\beta) = 0.92$ and $p < 0.001$. On the other hand, youth who lived in areas with environmental risk factors were 1.26 times more likely to be obese, which were statistically significant with $\text{Exp}(\beta) = 1.26$ and $p < 0.001$. See Table 4.10 for the results of this model.

Table 4.10 Regression Model for Obesity and the Physical Environment Factors' Scales

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.484	.029	280.63	1	.000	0.616	0.582	0.652
Ethnicity	.156	.015	115.17	1	.000	1.169	1.136	1.203
Child Age	-.097	.010	90.996	1	.000	0.907	0.890	0.926
Poverty Level*	-.573	.037	238.04	1	.000	0.564	0.524	0.606
Physical Environment Risk Factor Scale	.053	.019	7.546	1	.006	1.055	1.015	1.096
Physical Environment Protective Factor Scale	-.076	.014	29.462	1	.000	0.927	0.902	0.953
Constant	1.520	.167	82.466	1	.000	4.572		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

4.4.7 Hypothesis 7

Research Hypothesis 7: Medical access is a predictive factor of childhood obesity among children ages 13 to 17 years-old.

Null Hypotheses 7: Medical access is not a predictive factor of childhood obesity among children ages 13 to 17 years-old.

The null hypothesis was rejected as a result of analysis by logistic regression. Again, a two-step regression analysis was used. In the first step, gender, ethnicity, age, and SES represented the demographic variables thought to predict obesity. As stated previously, the logistic regression model for Step 1 was significant and these demographic variables contributed

significantly to the Step 1 model. The Nagelkerke R^2 was .046 for the logistic model of the demographic variables, accounting for 4.60% of the variance.

In the second step, two of the original medical accessibility questions were used because of a lack of statistical significance of the other questions, which contributed nothing to the model. The two questions that were used in this analysis were “During the past 12 months, do the doctors spend enough time with your child?” and “During the past 12 months, was there a time when your child needed health care but was delayed and not received?” These two questions accounted for 5.0 % of the variance, with a Nagelkerke $R^2$of 0.05 and $p< 0.001$, signifying statistical significance. See Table 4.11 for results of this model.

Table 4.11 Regression Model for Obesity and the Four Medical Accessibility Variables

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.495	.032	245.979	1	.000	0.609	0.573	0.648
Ethnicity	.155	.016	94.705	1	.000	1.168	1.132	1.205
Child Age	-.098	.011	77.426	1	.000	0.907	0.887	0.927
Poverty Level*	-.601	.042	206.394	1	.000	0.549	0.505	0.595
Medical care delayed	.267	.064	17.426	1	.000	1.306	1.152	1.481
Child has personal doctor	.124	.070	3.098	1	.078	1.132	0.986	1.299
Communication with doctor is adequate	-.004	.024	.026	1	.873	0.996	0.951	1.044
Time doctor spends with child is adequate	-.073	.019	14.351	1	.000	0.930	0.895	0.965
Constant	1.467	.210	49.004	1	.000	4.335		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

4.4.8 Hypothesis 8

Research Hypothesis: Of all the predictive factors, medical access is the best predictor of childhood obesity.

Null Hypothesis: Of all the predictive factors, there is no difference in the predictive effects of the different factors.

Both the null and research hypothesis were rejected as a result by logistic regression analysis. The null hypothesis was rejected because a difference existed in the predictive effects of the different factors, and the research hypothesis was rejected because medical access was not the best predictor of childhood obesity. Medical access was not statistically significant in the

full model. Using the logistic regression model, all predictor variables accounted for approximately 6.3% of the variance in childhood obesity, with a Nagelkerke R^2 of 0.06. Logistic regression showed that the best predictor of childhood obesity was academic development risk, showing statistically significance and an Exp(β) = 1.25 and $p< 0.001$. Ethnicity was shown to be the second best predictor, with an Exp(β) = 1.15 and $p< 0.001$. Social capital, physical environment, and medical accessibility demonstrated no statistical significant difference when used in the full model and with the demographic variables. The results of this analysis, using the full model, can be seen in Table 4.12.

Table 4.12 Full Regression Model for Obesity and the Demographic Variables Plus All Independent Variables and Scales

Variables in Order of Entry	β	*SE*	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval for Odds Ratio	
							Lower	Upper
Gender	-.317	.057	30.852	1	.000	0.728	0.651	0.815
Ethnicity	.142	.030	22.240	1	.000	1.153	1.086	1.223
Child Age	-.092	.020	20.976	1	.000	0.912	0.877	0.949
Poverty Level*	-.457	.074	38.268	1	.000	0.633	0.548	0.732
Social Capital Scale	-.015	.010	2.301	1	.129	0.985	0.965	1.005
Academic Risk Scale	.223	.030	54.886	1	.000	1.250	1.179	1.326
Physical Environment Risk Factors Scale	.005	.039	0.019	1	.891	1.005	0.932	1.085
Physical Environment Protective Factors Scale	-.083	.028	8.922	1	.003	0.920	0.872	0.972
Medical care delayed	.161	.087	3.459	1	.063	1.175	0.991	1.393
Time doctor spends with child is adequate	-.051	.035	2.131	1	.144	0.950	0.887	1.018
Constant	1.476	.360	16.842	1	.000	4.375		

Note. * indicates Poverty Level as dichotomized variable representing At or Below 150% of Federal Poverty Level or Above 150% of Federal Poverty Level.

4.5 Conclusions

From this statistical analysis, the demographic data revealed that childhood obesity manifests itself more pervasively in minority groups, with the highest prevalence in African-Americans, followed closely by Hispanics. African-Americans and Hispanics incurred a childhood obesity prevalence that was approximately 50% higher than that of Whites. In addition, males

and low SES were found to be risk factors that positively correlated to childhood obesity. In addition, academic development, social capital, physical environment, and medical accessibility were correlated to childhood obesity for youth in ages 13 to 17 years-old.

CHAPTER 5

DISCUSSIONS AND IMPLICATIONS

5.1 Introduction to Discussions and Implications

This dissertation was conducted to examine social and environmental determinants of childhood obesity by culling relevant elements from theories of Social Capital and Ecological Systems and statistically analyzing those elements from the National Survey of Children's Health (NSCH) database. The elements investigated in this dissertation included social capital, academic development riskoooo, environmental factors, and medical accessibility. While contemporary literature has included fractional aspects of those elements and their relevance to childhood obesity, none has addressed them as a group with theoretical foundations and statistical models for a relational and comparative analysis. The data used in this analysis derived from NSCH, a database with 31,001 youth ages 13 to 17 years-old from the 50 states of the United States. The sample population from this database provided an accurate representation of the childhood obesity epidemic in the United States because it closely characterized the dimensions of this disease as reported in contemporary literature and confirmed extant research findings in terms of obesity rates, male and female obesity ratio, SES correlations with obesity, and ethnic associations with obesity. For childhood obesity, the statistical parallelism between the NSCH database and the national inventory reinforced the validity of the NSCH database.

Chapter 4 included the statistical findings, identified implications for social work policy and future research, appraised the strengths of this manuscript's scholarship, critiqued the limitations of this study, and concluded with a summary of its findings and recommendations.

The overall purpose of this study was to identify social and environmental determinants of childhood obesity. Some determinants might not be protective or risk factors in isolation, but when in tandem with other determinants, they might exert a symbiotic effect in the development of childhood obesity.

5.2 Discussion of Findings

5.2.1 General Demographics Findings

NSCH's statistics on childhood obesity revealed statistically significant differences for various demographic variables. For youth who were 13 to 17 years old in the NSCH database, obese children were more likely to be males, African-Americans or Hispanics, and from a lower SES, thus confirming contemporary research findings and validating the NCHS database as a credible source of data (Blomquist & Bergstrom, 2007; Johnson et al., 2006; Mahoney, Lord, & Carryl, 2005; National Center for Health Statistics, 2008).While the demographic findings from this sample confirmed the work of existent research, the findings derived from the social and environmental determinants uncovered consequential nuances that can impel the proliferation of childhood obesity and protract the delinquencies of its sequelae. The sections that follow address the different demographic variables and the social and environmental determinants that affect childhood obesity. However, the intention of this manuscript was to evaluate the social and environmental determinants but not the demographic determinants of childhood obesity; therefore, the demographic variables and their relationship to childhood obesity are only briefly mentioned.

5.2.2 Gender and Childhood Obesity

In this sample, the percentage of males with childhood obesity exceeded those of females (16.3% versus 10.6%). This statistic supported the findings of other research studies that had investigated gender related differences of childhood obesity (McCreary, Saucer, & Courtenay, 2005; Simen-Kapeu & Veuguelers, 2010). Males' perceptions and suppositions of an

ideal physique differ from that of females: Males' idealistic physique emphasizes body mass and masculinity (McCreary et al., 2005; O'Dea & Caputi, 2001),and thus leading to increased prevalence of childhood obesity for males. Researchers (O'Dea, 2008; O'Dea & Caputi, 2001; Vartanian, Giant, & Passino, 2001) have suggested that body "bigness" serves as males' desire for sporting aspirations and social norms; provides a veneer of masculinity and toughness; and girds against insinuations of femininity and fragility. In addition, boys often perceive dieting as a feminine behavior (Grogen & Richards, 2002; McCreary et al., 2005) and may internalize or discount their obesity-related body dissatisfaction rather than affirm or edify the realities of their tacit acknowledgement.

Although body dissatisfaction affects both boys and girls, the dissatisfaction diverges in different directions: Boys construe "bigness" as an asset while girls interpret that as a liability (O'Dea & Caputi, 2001; Vartanian et al., 2001). For boys, the "drive for bulk" contrasts starkly with the "drive for thinness" in girls (Vartanian et al., 2001), leading to a gender disparity in childhood obesity, which was evident by the statistical analysis in this data sample in which obesity is 59.4% more common in boys. This gender disparity can be explained bymass-media appeal, self-esteem, peers' expression of body images, and other factors. In particular, the visceral messages from the media, focusing on thinness and attractiveness for women, disconcert and etiolate girls' self-esteem more so than boys (McCreary et al., 2005; O'Dea & Caputi, 2001; Vartanian et al., 2001). For example, O'Dea & Caputi (2001) found that obese adolescent boys maintained a positive self-esteem and expressed a lack of interest in dieting despite being obese. On the other hand, in the same research study, researchers found 40% of the girls perceived themselves as "too fat," but 80% of the study sample—both obese and non-obese girls—were engaged in active dieting regardless of their weight status. Therefore, it should come as no surprise that childhood obesity occurs more in boys than in girls, a finding

affirmed by this dataset which concurred with national statistics concerning gender and childhood obesity.

5.2.3 Ethnicity and Childhood Obesity

This study revealed that obesity affects more Africans-American and Latino children than their White counterparts. This finding confirmed other research in which African-Americans and Latinos, regardless of age, were observed to be two of the most obese of all ethnic groups (Byrd-Williams, et al., 2007; Hawks & Madanat, 2003; Hudson, et al., 2005; James et al., 2006;Lutfiyya et al., 2008; Haas, Lee, Kaplan, Sonneborn, Phillips, & Liang, 2003; Salsberry & Reagan, 2009; Strauss & Pollack, 2001). One of the most significant risk factors for the disparity in these two ethnic groups was their cultural perceptions of the ideal body image. For Latinos, a stout and bulky child conveys a positive aesthetic value and symbolizes affluence and happiness (Ariza, Chen, Binns, & Christoffell, 2004; Contento, Basche, & Zybert, 2003; Kaufman & Karpati, 2007), while for some African-American females, a large frame is not only culturally acceptable but also highly desirable (Jain et al., 2001), probably because some African-American men have been found to express a preference for women with a heavier body weight and larger body size (Boyington et al., 2008; Caprio et al., 2008).

While body weight might negatively correlate with self-esteem in White adolescents, Haas et al. (2003) found no such correlation among African-American adolescents, partially explaining the scarcity of eating disorders such as bulimia or anorexia in this population. Instead, African-American adolescents may perceive obesity as problematic only when functional limitations resulted, schoolyard taunts occurred, or peer relationships collapsed (Burnet, 2007; Gore, 1999; Jain et al., 2001). Minority cultures may view the dominant culture's ideals of a healthy weight as an affront to their parenting skills or their physical appearance. In Gore's (1999) study, African-American females believed that norms of body weight focused on the dominant culture's view of beauty, and that weight charts perpetuated the notion that they were

not beautiful. Other researchers have suggested that weight charts sublimated an unintended message that parents foundered in their parenting skills, causing their children to become obese (Jain et al., 2001). In addition, some African-American mothers refused to believe their children were overweight even if providers explained weight and growth charts to them, with a combined dislike, distrust, and disregard of medical information in which they admonished as an instrument of the dominant culture (Burnet, 2007; Gore, 1999; Jain et al., 2001).

5.2.4 Socioeconomic Status and Childhood Obesity

Consistent with existing research, in this study, socioeconomic status (SES)negatively correlated with childhood obesity (Hawks & Madanat, 2003; Hudson et al., 2005; James et al., 2006; Lutfiyya et al., 2008; Haas et al., 2003; Salsberry & Reagan, 2009). In this study, youth who lived below 150% of federal poverty level had a 59.7% higher chance of being obese than those living at or above 150% of federal poverty level. A low SES facilitates childhood obesity due to various factors: impoverished neighborhoods unfit for unsupervised outside play; more fast-food places in lower income neighborhoods; dilapidated playgrounds and parks; unsafe streets for children; less gym memberships; families relying on inexpensive, energy dense, and processed foods; parental concerns focused more on drugs or sex and not health or obesity; and a deferment or dereliction of medical visits (Black & Macinko, 2007; Dalton, 2007; Freeman, 2007). Furthermore, the population living in the low SES strata may not regard childhood obesity as a serious risk. For those living in low SES, more pressing issues transcend the risks of childhood obesity, for it lacks the urgency of food or shelter imperatives, the intensity of drug or sexual disconsolations, or the distress of financial or employment insecurity. Thus, childhood obesity occupies an unpersuasive position in the hierarchy of daily sustenance concerns, especially when these concerns in everyday life restrict self-actualization options, and this position in the hierarchy tends to overlook childhood obesity and unwittingly harbors its latent and obstinate repercussions.

5.3 Major Hypothesis Findings

The four social and environment independent variables—academic development risks, medical access, social capital, and physical environment—were statistically significant for childhood obesity when analyzed independently using logistic regression. However, when all four variables were included in the final regression model, only academic developmental risk performed as a statistically significant factor. While the independent variables affected childhood obesity in the singular logistic regression models, the independent variables as a group minimally increased the amount of variance for explaining childhood obesity in the full, final regression model, suggesting that other variables, not considered in this study, also play a role in the development of childhood obesity.

5.3.1 Academic Development Risks and Childhood Obesity

Using logistic regression, academic development risks were statistically significant factors for childhood obesity. Education underachievement perpetuates the cycle of disadvantage by correlating with numerous variables, ranging from poverty, crime, unemployment, human capital, social capital, and health. As a component of health, childhood obesity also succumbs to the restraints of education underachievement by actualizing itself more frequently in youth with subdued academic attainment. In this study, regression analysis indicated that academic development risks were a statistically significant predictor for childhood obesity, in which students with higher academic risk development showed a 1.265 times higher chance of obesity than students with less academic risk, confirming findings in recent literature (Datar & Sturm, 2006; Hollar et al., 2010; Krukowski et al., 2009; Schwimmer et al., 2003). When viewed in an opposite spectrum—meaning that highest academic achievements or developments should correlate with the lowest childhood obesity rates—the findings in this analysis supported a contemporary trend: Asians, who epitomize academic achievements in the

United States and have surpassed Whites and other ethnic groups in that arena, have established themselves as the subpopulation with the lowest childhood obesity prevalence.

Childhood obesity detracts academic development from youth by various means, including interference with school attendance, psychosocial development, self-esteem issues, and behavioral problems (Datar & Sturm, 2006; Krukowski et al., 2009). In schools, physical attributes of adolescents and children, such as weight, instigate teasing and ridicule from other students, which in turn can lead to poor self-image or social rejection (Warschburger, 2005). These psychosocial issues stigmatize overweight youth, divert concentration and attention away from school work, and interfere with classroom learning, thereby impeding a robust temperament for scholastic expediency and cultivating a climate conducive to absenteeism, tardiness, or academic indifference (Datar & Sturm, 2006). In addition to psychosocial issues, school attendance can be compromised as a result of childhood obesity's concomitant illnesses, supplanting classroom activities with doctor's visits or hospital admissions. The missed days, missed classes, and school disruptions subsequently dampen school performance and may permanently change the youth's educational and employment trajectories even after they reach adulthood.

Academic developmental risks undermine childhood obesity by adhering to the theoretical framework of ecological systems theory (EST) and social capital. Despite their heterogeneous premises, EST and social capital complement one another with a relational alignment that harbors obesity in children and inculcates acceptance and indifference for obesity. This indifference and acceptance for obesity in an academic context can be explained by the theoretical confluences of social capital and EST. Because social capital was postulated to be when people relate and connect to one another through social norms, and EST was assert to be the dynamics among subsystems influence the way people interact with one another, obese children in schools might have conditioned themselves to believe that extra body weight

conforms to the status quo and therefore might have adjusted their standards of weight and for social interactions using a mindset congruent to those of the other obese children around them. For example, researchers have chronicled that a person's chances of becoming obese increase by 57% if he or she has friends who are also obese (Christakis & Fowler, 2007), suggesting that people trivialize obesity when their acquaintances have habituated and acclimated themselves to this anomie, and that obesity begets more obesity through social connections (social capital) and interactional dynamics with other subsystems (EST).

5.3.2 Social Capital and Childhood Obesity

Logistic regression analysis revealed social capital was a statistically significant factor for childhood obesity. Ahern and Hendryx (2005) defined social capital as "the stock of trust, civic engagements, and reciprocity existing in a community that allows collective actions to occur" (p. 183). Simply put, social capital links people and resources together. Extending social capital and EST together to explain childhood obesity, the integration of the two theories offers a logical premise for development of obesity. Social capital emphasizes interconnections among people, and because humans express an innate desire for social connectivity, including reciprocal gains and mutual auspices, a deprivation of social capital abets social isolation, emotional and material desolation, and resources and information deterioration, leading to evolutionary changes that enfeeble health related issues such as childhood obesity. Individuals living in families and communities with low social capital rehash outdated information and exhaust community resources, thereby restricting and preserving a parochial mentality for options of obesity prevention, treatment, or education.

Likewise, social capital influences EST's subsystems in sustenance of childhood obesity. In EST, the ecological landscape progresses to and interacts with the different subsystems: microsystem, mesosystem, exosystem, and the chronosystem (Bronfenbrenner, 1979). For a community which lacks social capital, in which an ecological systems' dynamics

languishes and entropy flourishes, individual networks (microsystems and mesosystems) not only express reduced capacity to reciprocate relationships and trust for each other but also decrease connections to secondary and tertiary social networks (exosystems), thereby ingraining a permanent insular existence (chronosystems) that inhibits collaborative actions (Ahern & Hendryx, 2005). When a lack of social capital uncouples the reciprocal dynamics in EST's subsystems, diseases such as childhood obesity thrive. As individuals live in families without solid relationships, the deficiency of rapport and concern extends into health issues and social networks, such as access for medical treatment or camaraderie for physical activities, which in turn leads to a larger context, such as a lack of community responsibility in improvement of health, thereby promoting a cycle of childhood obesity not necessarily created by willful negligence but of ignorant apathy.

5.3.3 Physical Environment and Childhood Obesity

Findings from this analysis revealed that physical environment's protective factors and risk factors were statistically significant for development of childhood obesity. The environmental protective factors in the analysis included whether a neighborhood has sidewalks, parks, playgrounds, recreation centers, or community centers, while the risk factors comprised the presence of litter, dilapidated buildings, graffiti, and run-down houses in a neighborhood. The role of environmental factors on childhood obesity has been reported with mixed results, in which some researchers have found correlations (Franzini et al., 2009; Rahman et al., 2011; Sallis & Glanz, 2009; Slater et al., 2010), and a smaller body of research showed either a weak or no correlation (Dunton et al., 2009; Romero et al., 2001). However, the studies mentioned previously cannot be juxtaposed and compared systematically because the environmental factors and demographics examined differed slightly for each study. Overall, although current literature has no consensus on environmental factors and childhood obesity, the prevailing view

is that environmental factors may play a role its development, and this view has garnered support from the results of this study.

However, the cross-sectional nature of this study prevented affirmation of a true causal relationship between neighborhood protective or risk factors and childhood obesity. The possibility exists that instead of neighborhoods determining the health or obesity status of their inhabitants, families with financial resources might choose a physical environment that offers sanitary conditions, parks, and playgrounds, safe places to play, or access for healthy foods, enabling those families to live in conditions that promote healthier living. On the other hand, residents with limited resources do not have the flexibility to make residential choices, and they are the same people who tend to be older, in poor health, and more reliant on neighborhood resources. When neither the individuals nor the neighborhoods have the resources to support each other, a cycle of negative synergy festers into unhealthy conditions for individuals living in the neighborhood and for the neighborhood itself.

Environmental protective and risk factors prognosticate the value of social capital and degrees of social integration in a community. In communities where environmental danger and physical disorder abound, parents might discourage the outdoor physical activities of children, reducing the sense of social cohesion that encourage group sports and individual outdoor play, and thereby might inadvertently procure obesity in children (Franzini et al., 2009). In addition, a reduction of social cohesion may influence childhood obesity at a community level by decreasing social exchange among adults and children, which in turn minimizes enforcement of social norms, including improvement of neighborhoods, support of physical activities, availability of adults who can chaperone children, and a culture of trust and fitness among its occupants (Franzini et al., 2009). Therefore, the integrity of neighborhood environments can be viewed as a partial function of social capital and ecological systems, and the corruption of this integrity might be related to the development of childhood obesity.

5.3.4 Medical Access and Childhood Obesity

Findings in this evaluation showed that delayed or neglect of medical care and inadequate time with doctors are statistically significant for the development of childhood obesity. Of the six items concerning medical access, the following four items were not statistically significant for childhood obesity: the absence of a personal medical doctor, adequate communication with medical personnel, current presence or absence of medical insurance, or presence or absence of medical insurance within the last 12 months. These findings appeared counterintuitive because despite childhood obesity's propinquity with health, most of the items analyzed in the medical utilization showed no correlation to its development. One reason for this contradiction might be medical access being utilized more for treatment and less for prevention, so the presence or absence of medical access becomes an eligible element in the development of childhood obesity since children who require medical intervention already have the disease. Parents might not concern their children with obesity prevention or treatment because this disease holds in abeyance its harmful, secondary effects, relegating medical prevention or treatment to a residual role until its complications have progressed to a point in which they can no longer be ignored.

One unexpected finding from this analysis was that the absence or presence of medical insurance did not contribute to childhood obesity, a finding that contradicted most current literature (Grow et al., 2010; Haas et al., 2003; Lee et al., 2010; Richardson & Norris, 2010; Vieweg et al., 2007). Haas et al. (2003) found that children's and adolescents' BMI increase in the following order when correlated to insurance accessibility: private insurance, state sponsored insurance such as Medicaid, and then no insurance. This contradiction between Haas et al. and the current findings might have occurred because of the large percentage of youth with insurance in this dataset, a percentage that included 93% of the sampled children, which made the dataset homogenous and difficult to discriminate for statistical significance. However, the

findings from this study should not be used to dismiss the importance of insurance coverage for youth, because the complications that derive from childhood obesity presage future medical or psychosocial problems that require the patronage of insurance coverage (Caprio et al., 2008; Fong & Franks, 2008).

Insurance coverage often dictates whether an individual receives medical treatment or prevention (Haas et al., 2003; Richardson & Norris, 2010), which can in turn determines neglect or delay of medical treatment of diseases such as childhood obesity. The dearth of medical treatment and insurance coverage diminishes social capital by interfering with an individual's connectivity with another group—health professionals—who can provide the expertise, resources, and practices to bridge the obesity disparity gap between groups, specifically, the groups with and without medical access. In addition, when the dynamics between EST's family subsystem (microsystem) and medical subsystem (mesosystem) flounders as a result of lack of insurance, deterioration of health related issues such as childhood obesity flourishes. With an absence of positive energy to enter the subsystems, entropy reduces access to available resources and decays the subsystems. In simpler terms, when an individual fails to communicate with his or her doctors due to lack of medical access, both sides suffer: Medical personnel suffer because they have distanced themselves from learning about new disease trends and treating new diseases in the community, and individuals suffer because they have received no guidance for their diseases. For childhood obesity, this erosion of subsystem dynamics and social capital not only empowers the momentum of an obesity uprising but also oppresses the emancipation of salutatory aspirations.

5.4 Limitations of Study

Despite efforts to construct a perfect study, several limitations exist for this data analysis. First, controversies have surrounded BMI as a measure of obesity, but its use as a proxy for obesity measurement has appeared in the overwhelming majority of contemporary literature on

health and obesity and has been called the “gold standard” by Blomquist and Bergstrom (2007). BMI often incorrectly labels a normal weight person as obese and an obese person as normal weight, causing type 1 and type 2 statistical errors, respectively. For example, a muscular athlete can appear as a false positive for obesity when using the BMI, while a female with a slender physique but with excess body fat can become a false negative. Until technology advances to a point in which body fat can be accurately measured, BMI as a measurement for obesity will continue to dominate the research in this field.

A second limitation on this methodology is the cross-sectional nature of the NSCH data set. Cross-sectional data yield information occurring at a single point in time, precluding determination of casual relationships for BMI and the different variables. The correlations among the criterion and predictor variables in this study might have been confounded by unobserved and immeasurable variables not included in the study and might have ended up with inadequate outputs and exposures for a methodical analysis. In this analysis, the combined variance of the four independent variables accounted for 5%, meaning other factors also contributed to childhood obesity but may not be a part of the secondary data.

Third, crucial factors involved in childhood obesity but not discussed in this analysis included ethnic biological makeup and its relationship to childhood obesity. Human biology involves genetics, biochemistry, physiology, and anatomy, academic disciplines that deviate from the domain of social work. For example, topics such as ethnic differences in insulin resistance, lipolysis, and release of stress hormones may be best left for researchers in the medical discipline. Yet biological makeup may account for a large part of the childhood obesity epidemic. Social workers can be employed to educate parents and children about biological makeup as part of obesity prevention.

Fourth, the answers on the NSCH survey resulted from parent’s self-reported responses rather than direct measurements. In large-scale surveys of children, adults’ assessments of

children and their living environments are often the rule rather than the exception (Black & Macinko, 2007), which in turn can lead to inaccurate reporting and misleading data, but because of the sheer volume of peer-reviewed literature that included self-reported data, this practice is accepted in research despite its obvious shortcomings. However, researchers should not disparage subjective reports or self-reported data. Often, the perception of an individual's reality may be more important than the reality itself, and this perception bridges the link between the external environments to an individual's internal processes, playing a crucial role in deciding how an individual interacts with his or her environment (Veugelers et al., 2007).There are both advocates and critics of self-reported data. For example, while Nyholm et al. (2007) stated that self-reported data tend to underestimate prevalence of obesity, Goodman, Hinden, and Khandelwal (2000) suggested that parent-reported data can be used to assess weight status in adolescence with 96% accuracy.

Fifth, the poverty indicator used in this analysis was at or below 150 % of Federal Poverty Line (FPL). Different classifications of the FPL would have provided a more nuanced distinction of poverty as it related to childhood obesity. Instead of classifying the different poverty levels in this analysis, this analysis used the level of 150 % below FPL because it is at a low to moderate level of poverty, and the finding from this threshold will provide the academic impetus to evaluate the different strata of SES as it related to childhood obesity for future research. A more stringent classification of poverty levels, if proven correlated to childhood obesity, would have added support to the theory that SES influences childhood obesity.

Finally, the scales in this dissertation were derived from secondary data. While secondary data does not mean inaccurate data, secondary data limits the amount of information that can be extracted for analysis, causing reduced validity or reliability for the scales. Validated instruments and scales increase rigor in statistical analysis, but for the measurements in this dissertation, such as academic development as it related to childhood obesity or social capital as

it relates to physical health, no such instrument or scale existed in the literature. While this study could have included analyzing each item in the scales separately, the intent of this researcher was to examine environmental or social determinants of childhood obesity as a group and representative scales of each determinant were used to elucidate a model for both the genesis and prevention of childhood obesity. Therefore, despite using the literature as a guide for construction, a perfect scale might not be tenable using secondary data or even primary data, and a margin of error can be expected.

5.5 Implications for Social Work Practice and Policy

Social capital and EST posited that multiple levels of influence combine to shape behaviors for an individual and for the community, including influences at the levels of the individual, social and cultural, organization, community, and policy (Bronfenbrenner, 1979; Davison & Birch, 2001; Halpren, 2005; Salis & Glanz, 2009; Veenstra et al., 2004). At best, individual interventions such as dieting and physical activities engender changes in motivation, knowledge, and behavior, but without environmental or policy modifications, those changes often falter due to an institutionalized infrastructure not conducive for developing a stout habituation (Salis & Glanz, 2009).In accordance with EST and social capital, an effective intervention by social workers would require multiple levels of interactions. Salis and Glanz (2009) suggested that an ideal intervention should actualize an environment in which people can make healthy choices; enhance social norms and connectivity; empower individuals to partake in health-related or self-improvement activities, especially childhood obesity education; and advocate for a universal fitness or anti-obesity policy. Social workers occupy a unique position among other professions in that the multi-level perspectives of social work make the profession particularly amendable to influence policies. By extending beyond the individualistic “eat less and exercise more” model that echoes from most weight loss intervention programs, social workers can influence different levels of the ecological landscape using principles applicable to social work.

5.5.1 Social Work and Academic Developmental Risks

An important social work implication generated from this study revolves around the academic environment for youth. As stated previously, of all the environmental determinants analyzed, academic developmental factors emerged as the single most important element for childhood obesity. Most school age children spent a large portion of their day at school, so by default, schools act as *in loco parentis* to 95% of school age children during school hours and bear fiduciary responsibility for the well-being of those kids, not limited just academically but also physically, emotionally, and socially (Harper, 2006; U.S. Department of Education, 2007).Children's vulnerabilities position them in such a way that they often do not and cannot make rational choices regarding their own well-being and may need laws to protect them (McLean, 2003; Moir, 2007). In combating childhood obesity, the responsibility in caring for a minor behooves upon the parents or legal guardians when inside their own homes, but part of that responsibility shifts to the government when the minors occupy a public domain such as schools.

As an institution that only comprises children, the public school can mitigate the childhood obesity epidemic through various means. First, schools should communicate with parents a health dissemination initiative that is mandatory and periodic concerning the health of school children in the same manner that report cards address children's academic endeavors. By communicating with parents, schools increase social capital and reinforce the interactions between the family and school subsystems. These elements have been shown to improve the health status of children (Ahern & Hendryx, 2005; Davison & Birch, 2001; Halpren, 2005; Salis & Glanz, 2009), especially for those in low SES, who flounder with minimal financial resources to acknowledge or to prevent the potential pitfalls of childhood obesity and may need to depend on a third party, such as schools, to relay such information. Second, social workers in schools can provide nutrition education to all children, ingraining a healthy mentality into the eating habits of

children. While critics may argue that this activity is a waste of time, since the eating habits of children are most likely determined by their parents, nutrition education may generate new ways of thinking for the current generation to practice and to impart upon the next generation. Finally, social workers must address bullying in schools. Although bullying is not a phenomena limited to obese children, obese children experience more taunting or bullying than non-obese children (Pearce, Boergers, & Prinstein, 2002). In a recent study, Lumeng et al. (2010) reported that bullying was the number one health concern for parents of obese children, surpassing the concerns of other medical related illnesses.

As an example of how schools can combat childhood obesity, in 2003, Arkansas's school systems enacted an initiative, called Act 1220, to inform parents of their children's BMI status and to screen children's BMI status. In addition, Act 1220 restricted access to vending machines, required public schools to disclosed their affiliations with beverage or snack companies, and mandated time for physical activities (Act 1220, 2003). Act 1220 was an acclaimed success: After its introduction in the Arkansas school system, the school children of Arkansas experienced slight reductions in BMI every year (Justus, Ryan, Rockenbach, Katterapall, & Card-Higginson, 2007), leading to its imitation in many states (Levi, Juliano, & Segal, 2006). Because 95% of school-aged children convene at schools daily, social workers should exploit the school venue in addressing childhood obesity and refine the successes of Act 1220 by advocating for the policies discussed in the preceding paragraph, perhaps bringing an even more polished version of this state level legislation to the national level.

5.5.2 Social Work and Medical Access

The findings in this analysis indicated that time spent with health care providers and delay or neglect of medical care plays a role in childhood obesity. Many families in the United States face barriers to health access, and even for those with medical insurance, high deductibles and first-pay expenses discourage them into seeking preventive measures until a

dysfunctional impasse has occurred. The nature of childhood obesity beguiles parents into delaying medical prevention or treatment because parents may believe a chubby child denotes health and a thin child represents neglectful parenting, a belief that is especially salient for low-income and ethnic minority mothers (Davison & Birch, 2001).In addition, the symptomatic effects of childhood obesity hibernate until late in its development, further masking any signs of medical urgency. When this delay of health care has festered obesity to a point in which obesity has settled during the pre-teen or teenage years, psychosocial or medical issues might have surfaced, and eating and recreational habits might have been established, making childhood obesity recalcitrant for reversal.

While social workers alone might not be able to trample the health insurance crisis, which has been an unresolved social enigma for decades, social workers can fill in this gap in social capital by disseminating obesity prevention education at individual and community levels. In addition to schools, other places that social workers can promulgate fitness information include community centers, Boys and Girls Clubs, churches, recreation centers, community health fairs, and large corporations. Social workers can provide cooking classes and initiate events that require physical activities, empowering individuals and families in bringing a sense of control and competency in their physical fitness but without the prerequisite medical insurance, and at the same, act as a proxy for medical prevention and bridges the gap in social capital as it pertains to medical knowledge. Currently, medical prevention has accounted for 3% of all medical expenditure expenses in the United States while medical treatment has been a disproportionate 97% (Dobelstein, 2003). By providing obesity prevention education to individuals and communities, social workers fill a much neglected gap in social services.

5.5.3 Social Work and Environmental Factors

The results of this analysis indicated environmental factors influence childhood obesity. Because the literature on this factor as a determinant of childhood obesity has been mixed

(Dunton et al., 2009; Franzini et al., 2009; Rahman et al., 2011; Romero et al., 2001; Sallis & Glanz, 2009; Slater et al., 2010), the results derived from this analysis must be viewed cautiously. The lack of empirical consistency suggested that other undiscovered social factors might be at play.

Social workers can improve neighborhood environments by organizing volunteer groups, advocating at city council meetings, soliciting support from local businesses and community members, and promulgating of media campaigns. However, these activities may be implemented while professionals inadvertently overlook the social factors that led to a neighborhood's deterioration. With that oversight, the community may then be captivated by transient gratification rather than by permanent empowerment. Therefore, in the battle against environmental risk factors for childhood obesity, social workers must delve beyond the proximal factors and penetrate the nucleus of distal factors.

Distal factors that cause disparities in neighborhood environment may be rooted in institutionalized dynamics, such as racial segregation, disenfranchised subpopulations, economic and social inequalities, poverty, income differences, discrimination, and oppression. Those social malignancies exacerbate one another, amplifying the level of dysfunction in the neighborhood, of which childhood obesity and physical environmental risks are just the byproducts of a myriad of symptoms. To change those institutional dynamics, social workers must endeavor themselves to a much more formidable enterprise than simply cleaning up the neighborhood or building a new playground. Instead, social workers should use the repertoire of social work principles available to them: advocacy, social policy, cultural competence, social justice, empowerment, etc. By utilizing social work principles, social workers might disrupt institutionalized components that nourish inequalities and increase in value the community capitals that effectuate community improvement. Advocating for neighborhood revitalization and desegregation may be a first step for social workers, but policies to reduce economic and health

disparities are needed to empower individuals who struggle in dilapidated neighborhoods that contribute to their health related adversities (Franzini et al., 2009).

5.5.4 Social Work and Social Capital

Social workers can help a community accrue social capital as it relates to childhood obesity in a number of ways. First, at the individual level, social workers can provide venues for social support, encourage social engagements, and develop interpersonal bonds among neighbors (Veenstra et al., 2004). Individual participation in obesity prevention activities that convey entertainment defrays the stigmatization for obese youths, who tend to be egocentric and blame themselves for their condition (Miller, 2007). Venues such as participation in various sports activities, health education, and cooking classes connect youths and adults alike and influence self-esteem and healthy behaviors. In addition, Eliadis (2006) suggested a strength-based perspective may be used: Parents who know how to cook can cook low-fat items at gatherings; children who play sports can be motivated to train for physical fitness; neighbors unfamiliar with one another can bond with one another and chaperone each other's children in outdoor play or play at recreation centers; and teachers in the community can be trained to teach the characteristics and behaviors of healthy lifestyles to youth.

Second, social capital, as it relates to childhood obesity, can accumulate at an organizational level. At community organizations and agencies, such as Boys and Girls Clubs or Big Brothers and Big Sisters, social workers can share organizational resources. From a strengths-based perspective, if one organization has a basketball court or indoor recreational facility, another organization can bring the equipment, drinks, and snacks, so youth from both organizations can benefit from the resources of the other. Likewise, the expertise of other organizations can be utilized. If an agency has experience with educational outreach on health related issues or has coaches on their staff, social workers can bridge an intra-organization link among various agencies. Probably the most valuable form of social capital involves forging links

between dissimilar groups or cultures (Halpern, 2005), because dissimilar groups can gain knowledge about each other, build trust and relationships otherwise not established with the other, and share resources that the other may not have known existed.

Third, at the community level, social workers can influence social capital by advocating for policy changes that can arrest the course of childhood obesity. Advocating for subsidizing of community centers, playgrounds, and recreational facilities will allow neighborhood patrons to socialize with one another and to engage in physical activities (Kim, Subramanian, Gortmaker, & Kawachi, 2006). Also, community social capital for health can be accumulated without its residents ever meeting each other. With the advent of numerous social media sites, social workers can build a virtual community that focuses on childhood obesity and health care and potentially connect with masses of people showing a common interest. An electronic community socially bonds a diverse group of strangers who can share knowledge and experiences that they would not have been able to share uninhibitedly if face-to-face meetings were a requirement. Finally, social workers can advocate for a national level fitness policy for the schools, perhaps a policy that mimics the bellwether Act 1220 of Arkansas, discussed earlier, but designed and implemented at the national level. Currently, no national level fitness policy exists for children despite the intrastate successes of Arkansas' Act 1220.

5.6 Recommendations for Future Research

While this study has added another layer of knowledge in the understanding of childhood obesity's multilayered social determinants, more research is needed. This study was partially conducted to examine academic developmental risks as it related to childhood obesity, but the dataset did not include parent's attitudes toward education or information about parental education attainment, which should be analyzed in future study. Parent's attitudes toward education might have influenced the outcomes of the current study because the academic developmental risks questions in this dataset comprised mainly of missing school days,

repeating grades, and academic failures. These behaviors could have been a consequence of parental attitude rather than of a youth's insubordination. When parents trivialize their education or their children's education as an expendable endeavor, the parents may bequeath this attitude to the next generation, leading to their children demonstrating apathetic dispositions toward school-related problems such as the ones analyzed in this study. Future studies should examine whether childhood obesity in relation to academic development can be explained by parental academic attainment or aspirations for themselves and their children.

In addition, the academic development risks factors analyzed did not include examination of the contextual implications that led to those risks being actualized. The scale in this study derived from the literature, expressed intuitive appeal, but conveyed a negative connotation because it was focused on the marginalized dimensions of academics. Contextual factors such as bullying, chronic sickness unrelated to obesity, or family dysfunctions could have contributed to academic risks outcomes. If variables outside the domain of schools or school personnel account for some of the variance in academic risks, then researchers should recognize and address those problems (Wooley et al., 2008). Further research should focus on the contextual milieu which causes the academic risk and quantify the influences it has on childhood obesity. This dataset did not include academic protective factors for childhood obesity, such as whether the schools engaged in nutrition education, mandatory time for physical fitness, or periodic measurements of BMI. More research needs to be performed on these protective factors when designing a childhood obesity prevention plan if a universal implementation is to be initiated.

Further study needs to be performed on environmental factors. The cross-sectional nature of this database only correlated childhood obesity with environmental risks and protective factors without the ability to draw casual relationships. While a true longitudinal study with controlled group, equivalent demographics, neighborhood, playgrounds, and sidewalks may be

impossible or prohibitively expensive to reproduce, future research should focus on opportunistic evaluations of environmental modifications, which may provide a clearer picture of changes in BMI that occur in concert with changes in the built environment (Dunton et al., 2009; Wells & Yang, 2007). Another environmental factor that deserves more research relates to understanding the linkages between environmental variables, such as the relationship between a recreation center and bike trails or between a park and sidewalks, that is, the joint contribution of a facility and the ease or difficulty to get to that location. While this study has been used to examine neighborhoods' structural assets or deficits as such relate to childhood obesity, the study did not include an analysis of the relationship *between* the structures. As an example of the importance of relationship between structure, Li, Dibley, Sibbritt, and Yang (2006) proposed that a lack or difficulty in accessing facilities for physical activities influences the sedentary behaviors of adolescents, suggesting that policies for new community facilities need to be evaluated in context with proximity and accessibility (Dunton et al., 2009).

A more sophisticated research on environmental factors would be to elaborate on a theoretical approach that can guide empirical studies. Using EST, Dunton et al. (2009) suggested that testing the interactions of the different subsystems might result in a higher variance for factors that contribute to BMI differences. For example, knowing how the environmental subsystem interacts with economic, political, or cultural subsystems could elicit a discernible level of nuances among the subsystems, and if a difference were established, researchers could differentiate the subsystems into a hierarchical order of statistical strength. In examining the interactions of different subsystems, instead of using cross-sectional data, future researchers should utilize longitudinal, experimental, or quasi-experimental design to establish direction of causality between environmental determinants and children's BMI measurements. However, such studies may be difficult to initiate because of the inherent difficulties in establishing a consistent set of variables to characterize neighborhood environments, in

standardizing their measurements, and in operationalizing definitions for neighborhoods (Veugelers et al., 2008).

In addition to environmental factors, further researchers should focus on improving communications between parents and health care providers. When parents and health care providers communicate effectively, the transfer of information yields a richer social capital (Courtwright, 2009; Halpren, 2005; Richardson & Norris, 2010) as well as providing positive input into the subsystems in EST (Davison & Birch, 2001).Obese patients might be less likely to raise concerns about their weight status because of the negative stigma involved which can lead to a deterioration of patient and provider communications (Durant et al., 2008). Because this study has shown time with health providers to be a statistically significant aspect of BMI variations, social work researchers should examine how to improve communication between parents and healthcare providers concerning childhood obesity and how to empower parents into attaining the knowledge and resource bases about this disease. Furthermore, more research is needed to explore parents' and health care providers' perception of childhood obesity and how that perception can affect bilateral participatory communications, because proficiency in communication between parents and health care providers may reverse the momentum of childhood obesity (Durant et al., 2008).

5.7 Conclusion

When the prevalence of childhood obesity has dramatically increased over a few decades, community leaders cannot simply attribute that increase to the promiscuous eating habits of a few individuals, but must recognize the environmental components that support its perseverance. The theme of "eat less and exercise more" to battle childhood obesity only embellishes the illusion of obesity being a choice, stigmatizes its young victims for their physical attributes, and condones the institutionalized components that desensitize individuals to community problems. This study was guided by Social Capital Theory and EST to explain

childhood obesity, and factors from multiple contexts that were thought to interact with one another were studied. In accordance to those theories, to unravel childhood obesity, change should include actors from different sectors, at different levels, cooperatively working in a logical fashion, with a unified effort and a collective will (Candib, 2007).

A multi-level approach for the prevention and resolution of childhood obesity at the individual, organizational, community, and national levels and through policy implementation is needed. Unlike interventions for individuals, which has had little success in sustained weight loss and resulted only in transient improvements (Hill et al., 2003; Nestle & Jacobson, 2000), a multi-level approach could be used to address the contextual complexity and interaction dynamics that enable childhood obesity. Given that some countries do not experience a childhood obesity epidemic, it might not be far-fetched to believe that institutionalized readjustments at different levels, as suggested by in this chapter, could one day make obsolete any direct individual interventions in diet or exercise.

REFERENCES

Act 1220 of 2003, Arkansas Annotated Code §§ 20-7-133-135 (2003).

American Obesity Association (2005).*AOA fact sheets.* Retrieved from http://www.obesity.org/information/what_is_obesity.asp

Acs, Z., & Lyles, A. (Eds.). (2007). *Obesity, business, and public policy.* Cheltenham, UK: Edward Elgar Publishing.

Aldana, S., & Pronk, N. (2001).Health promotional programs, modifiable health risks, and employee absenteeism. *Journal of Occupation Health Medicine, 43*(1), 36-46.

Ahern, M., & Hendryx, M. (2005).Social capital and risks for diseases. *Chronic Illnesses, 1*, 183-190.

Ariza, A., Chen, E., Binns, H., & Christoffell, K. (2004). Risk factors for overweight in five to six year old Hispanic-American children: A pilot study. *Journal of Urban Health, 81*(1), 2004.

Bahr, P. (2007). Race and nutrition: an investigation of Black- White differences in health-related nutritional behaviours. *Sociology of Health & Illness, 29*(6), 831-856.

Baum, C., & Foreman, R. (1984). Social factors associated with obesity. *Journal of Pediatric Psychology, 9*, 293-302.

Bhattacherjee, A., Chau, N., Sierra, C., Legras, B., Benamghar, L., Michaely, J.,…Mur, J. (2003). Relationships of job and some individual characteristics to occupational injuries in employed people: A community-based study. *Journal of Occupational Health, 45*(6), 382-391.

Bibeau, W., Moore, J., Caudill, P., & Topp, R. (2008).Case study of a transtheoretical case management approach to addressing childhood obesity. *Journal of Pediatric Nursing, 23*(2), 92-100.

Birch, L., & Marlin, D. (1982). I don't like it; I never tried it: Effects of exposure on a two year-olds food preference. *Appetite, 3*, 353-360.

Black, J., & Macinko, J. (2007).Neighborhoods and obesity. *Nutrition Reviews, 66*(1), 2-20.

Blomquist, H., & Bergstrom E. (2007).Obesity in 4-year0old children more prevalent in girls and in municipalities with a low socioeconomic level. *Acta Paediatrica, 96*, 113-116.

Bourdieu, P. (1983). Forms of capital. In J.C. Richards (ed.). *Handbook of Theory and Research for the Sociology of Education.* New York: Greenwood Press.

Boyington, J., Carter-Edwards, L., Piehl, M., Hutson, J., Langdon, D., & McManus, S. (2008). Cultural attitudes towards weight, diet, and physical activity among overweight African-American girls. *Preventing Chronic Disease 5*(2), 1-14.

Bronfenbrenner, U. (1979). Ecology of human development. Cambridge, MA: Harvard University Press.

Burdette, H., & Whitaker, R. (2003). Neighborhood playgrounds, fast food restaurants, and crime: Relationships to overweight in low-income preschool children. *Preventive Medicine, 38*, 57-63.

Burnet, D., Plaut, A., Ossowski, K., Ahmad, A., Quinn, M., Radovick., S., et al. (2007) Community and family perspectives on addressing overweight in urban, African-American youth. *Journal of General Internal Medicine, 23*(2), 175 -179.

Burton, W., Chen, C., Schlutz, A., & Edington, D. (1999). The costs of body mass index in an employed population. *Statistical Bulletin of Metropolitan Insurance Companies, 80*(3), 8-14.

Byrd-Williams, C., Kelly, L., Davis, J., Spruijt-Metz, & Goran, M. (2007). Influence of gender, BMI, and Hispanic ethnicity on physical activity in children. *International Journal of Pediatric Obesity, 2*, 159 -166.

Candib, L. (2007). Obesity and diabetes in vulnerable populations: reflection on proximal and distal causes. *Annals of Family Medicine, 5*(6), 547 -556.

Caprio, S., Daniels, S., Drewnowski, A., Kaufman, F., Palinkas, L., Rosenbloom, A. (2008). Influence of race, ethnicity, and culture on childhood obesity: implications for prevention and treatment: a consensus statement of shaping American's health and the obesity society. *Diabetes Care, 31*(11), 2211 -2222.

Carlson, S., Fulton, J., Lee, S., Maynard, M., Brown, D., Kohl, H., & Dietz, W. (2008). Physical education and academic performance in elementary school: Data from the early childhood longitudinal study. *American Journal of Public Health, 98*(4), 721-727.

Centers for Disease Control and Prevention. (2009). *About BMI for children and teens.* Retrieved from http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_ childrens_bmi.html

Centers for Disease Control and Prevention. (2007). *Overweight and obesity: Health Consequences.* Retrieved from http://www.cdc.gov/nccdphp/dnpa/obesity/ consequences.htm

Chen, A., Kim, S., Houtrow, A., & Newacheck, P. (2010). Prevalence of obesity among children with chronic conditions. *Obesity Journal, 18*(1), 210-213.

Christakis, N., & Fowler, J. (2007). The spread of obesity in a large social network in 32 years. *The New England Journal of Medicine, 357*, 370-379.

Clark, D., & Slate, J. (2009). Children's weight and academic performance in elementary school: Cause for concern? *Analyses of Social Issues and Public Policy, 9*(1), 185-204.

Cleave, J., Gortmaker, S., & Perrin J. (2010). Dynamics of obesity and chronic health conditions among children and youth. *Journal of American Medical Association, 303*(7), 623- 629.

Cohen, D., Finch, B., Bower, K., & Sastry, N. (2006). Collective efficacy and obesity: The potential influence of social factors on health. *Social Science and Medicine, 62*, 769-778.

Cole, T., Bellizzi, M., Flegal, K., & Dietz, W. (2000).Establishing a standard definition for child overweight and obesity worldwide: International survey. *British Medical Journal, 320*(7244), 1240-1243.

Contento, I. R., Basche, C., & Zybert, P. (2003).Body image, weight, and food choices of Latina women and their young children. *Journal of Nutrition Education and Behavior, 35*(5), 236-248.

Cooper, H., & Geyer, R. (2009). What can complexity do for diabetes management? Linking theory to practices. *Journal of Evaluation in Clinical Practices, 15*, 761-765.

Courtwright, A. (2009). Justice, stigma, and the new epidemiology of health disparities. *Bioethics, 23*(2), 90-96.

Crounch, P., O'Dea, J., & Battisti, R. (2007). Child feeding practices and perceptions of childhood overweight and childhood obesity risk among mothers or preschool children. *Nutrition and Dietetics, 64*, 151-158.

Dalton, S. (2007). Our vulnerable children: Poor and overweight. *Southern Medical Journal, 100*(1), 1- 2.

Dater, A., & Strum, R. (2006). Childhood obesity and elementary school outcomes. *International Journal of Obesity, 30*, 1449- 1460.

Davison, K., & Birch, L. (2001). Childhood overweight: A contextual model and recommendations for future research. *Obesity Reviews, 2*, 159- 171.

De Beers, M., Hofsteenge, G., Koot, H., Hirasing, H., Delemarre-van de Wall, H., & Gemke, R. (2007). Health related quality of life in obese adolescents is decreased and inversely related to BMI. *Acta Paediatrica, 96*, 710-714.

Dhoble, A., Patel, K., & Young, A. (2008).Familial and behavioral determinants of obesity in black children, and preventive strategies. *Internet Journal of Health, 7*(2), 1-14.

Dietz, W. (2004). Overweight in childhood and adolescence. *New England Journal of Medicine, 350*, 855-857.

Dobelstein, A. (2003). *Social welfare: policy and analysis* (3rd ed.). Pacific Grove, CA: Brooks/Cole.

Dominguez, S., & Arford, T. (2010). It is all about who you know: Social capital and health in low-income communities. *Health Sociology Review, 19*(1), 114-129.

Dunton, G., Kaplan, J., Wolch, J., Jerrett, M., & Reynolds, K. (2009). Physical environmental correlates of childhood obesity: A systemic review. *Obesity Reviews, 10*, 393-402.

Duerksen, S., Elder, J., Arredondo, E., Ayala, G., Slyman, D., & Campbell, N., et al. (2007). Family restaurant choices are associated with child and adult overweight status in Mexican-American families. *Journal of the American Dietetic Association, 107*(5), 849-853.

Eiser, C., & Morgan, R. (2001). A review of quality-of-life for children with chronic illnesses. *Archives of Diseases in Children, 84*, 205-211.

Elder, J., Arredondo, E., Campbell, N., Baquero, B., Duerksen, S., Ayala, G.,…McKenzie, T. (2010). Individual, family, and community environment correlates of obesity in Latino elementary school children. *Journal of School Health, 80*(1), 20-30.

Eliadis, E. (2006). The role of social work in the childhood obesity epidemic. *Social Work, 51*(1), 86 -88.

Finkelstein, E., Fiebelkorn, I., & Wang, G. (2003). National medical spending attribute to overweight and obesity: How much, and who's paying. *Health Affairs, 12*(1), 18-24.

Finkelstein, E., Ruhm, C., & Kosa, K. (2005). Economic causes and consequences of obesity. *Annual Reviews of Public Health, 26*, 239-257.

Fong, R., & Franks, P. (2008). Body mass index and employment-base health insurance. *Biomed Central Health Services Research, 8(*101), 1-7.

Fisher, B. (2006). Community-based efforts at reducing America's childhood obesity epidemic: Federal lawmakers must weight in. *DePaul Law Review, 55*, 711-749.

Franzini, L., Elliott, M., Cuccaro, P., Schuster, M., Gilliland, J., Grunbaum, A.,…Tortolero, S. (2009). Influences of physical and social neighborhood environments on children's physical activity and obesity. Amer*ican Journal of Public Health, 99*(2), 271-278.

Freeman, A. (2007). Fast food: Oppression through poor nutrition. *California Law Review, 95*(6), 2221-2260.

Freeman, D., Khan, L., Serdula K., Dietz, W., Srinivasan, S., & Berenson, G. (2005). The relationship of overweight to cardiovascular risk factors among children and adolescent: The Bogalusa heart study. *Pediatrics, 103*, 1175-1182.

Fuentes-Afflick, E., & Hessol, N. (2008). Overweight in young Latino children. *Archives of Medical Research, 39*(5), 511-518.

Geier, A., Foster, G., Womble, L., MaLaughlin, J., Borradaile, K., Nachman, J….Shults, J. (2007). The relationship between relative weight and school attendance among school children. *Obesity, 15*(8), 2157-2161.

Goodman E., Hinden, B., & Khandelwal, S. (2000). Accuracy of teen and parental reports of obesity and body mass index. *Pediatrics, 106*, 52-58.

Goodman, E., Slap, G., & Huang, B. (2002). The public health impact of socioeconomic status on adolescent depression and obesity. *American Journal of Public Health, 93*(11), 1844-1850.

Gordon-Larsen, P., Adair, L., & Popkin, B. (2002). The relationship of ethnicity, socioeconomic factors, and overweight in U.S. Adolescents. *Obesity Research, 11*(1), 121-129.

Gore, S. (1999). African-American women's perception of weight: paradigm shift for advanced practice. *Holistic Nursing Practice, 13*(4), 71-79.

Greenberg, D., & LaPorte, D. (1996). Racial differences in body type preferences of men for women. *International Journal of Eating Disorders, 19*, 275-278.

Grogen, S., & Richards, H. (2002). Body image: *Focus groups with boys and men. Men and Masculinity, 4,* 219 -232.

Grow, H., Cook, A., Arterburn, D., Saelens, B., Drewnowski, A., & Lorzano, P. (2010). Child obesity associated with social disadvantage of children's neighborhoods. *Social Science and Medicine, 71,* 584-591.

Haas, J., Lee, L., Kaplan, C., Sonneborn, D., Phillips, K., & Liang, S. (2003). The association of race, socioeconomic status, and health insurance status with the prevalence of overweight children and adolescent. *American Journal of Public Health, 93*(12), 2105-2110.

Haines, J., & Neumark-Sztainer, D. (2009). Psychosocial consequences of obesity and weight bias: implications for intervention. In Heinberg, L., & Thompson, K. (Eds.), *Obesity and Youth: Causes, Consequences, and Cures* (pp.79-98). Washington, DC: American Psychological Association.

Halpren, D. (2005). *Social Capital.* Cambridge, UK: Polity Press.

Hannon, T., Rao, G., & Arslanian, S. (2005). Childhood obesity and type 2 diabetes mellitus. *Pediatrics, 116*(2), 473-480.

Harper, M. (2006). Childhood obesity: Strategies for Prevention. *Family Community Health, 29*(4), 288-298.

Hawks, S., & Madanat, H. (2003). Stemming racial and ethnic disparities in the rising tide of obesity. *American Journal of Education, 34*(2), 90 -96.

Hering, E., Pritsker, I., Gonchar, L., & Pillar, G. (2009). Obesity in children is associated with health care use. *Clinical Pediatrics, 48*(8), 812-818.

Hill, J., Wyatt, H., Reed, G., & Peters, J. (2003). Obesity and the environment: Where do we go from here? *Science, 299*(5608), 853-855.

Hollar, D., Messiah, S., Lopez-Mitnik, G., Hollar, L., Almon, M., & Agatston, A. (2010). Effect of a two-year obesity prevention on percentile changes in body mass index and academic performance in low-income elementary school children. *American Journal of Public Health, 100*(4), 646-653.

Holtgrave, D., & Crosby, R. (2006). Is social capital a protective factor against obesity and diabetes? Findings from explorative studies. *Annals of Epidemiology, 16*(5), 406-409.

Howell, D. (2007). *Statistical method for psychology* (7th ed.). Belmont, CA: Cengage Wadsworth.

Hudson, C. (2008). An integrative study of obesity prevention in African-American children. *Issues in Contemporary Nursing, 31*, 147-170.

Hughes, A., Farewell, K., Harris, D., & Reilly, J. (2007). Quality of life in a clinical sample of obese children. *International Journal of Obesity, 31*(1), 39-44.

Jain, A., Sherman, S., Chamberlin, L., Carter, Y., Powers, S., & Whitaker, R. (2001). Why don't low-income mothers worry about their pre-schoolers being overweight. *Pediatrics, 17*(5), 1138 -1156.

James, S., Fowler-Brown, A., Raghunathan, T., & Van Hoewyk, J. (2006). Life-course socioeconomics position and obesity in African-American women: The Pitt County Study. *American Journal of Public Health, 96*(3), 554-559.

Johnson, S., Pilkington, L., Deeb, L., Jeffers, S., He, J., Lamb, C. (2007). Prevalence of overweight in north Florida elementary and middle school children: Effects of age, sex, ethnicity, and socioeconomic status. *Journal of School Health, 77*(9), 630-636.

Jones, R., Okely, A., Parriel, G., & Cliff, D. (2009).Relationship between weight status and child, parent, and community characteristics in preschool children. *International Journal of Pediatric Obesity, 4*, 54-60.

Justus, M., Ryan, K., Rockenbach, J., Katterapall, C., & Card-Higginson, P. (2007). Lessons learned while implementing a legislated school policy: Body mass index assessment among Arkansas's public school students. *Journal of School Health, 77*(10), 706 -713.

Kaiser Foundation (2010). *Health Affairs.* Retrieve from http://www.kff.org/insurance/090210nr.cfm

Kaufman, L., & Karpati, A. (2007). Understanding the sociocultural roots of childhood obesity: Food practices among Latino families of Bushwick, Brooklyn. *Social Science and Medicine, 64*(11), 2177-2188.

Keating, D., & Hertzman, C. (Eds.) (1999). *Developmental health and wealth of nations.* NY, NY: The Guildford Press.

Kean, L., & Prividera, L. (2007). Communicating about race and health: A content analysis of print advertising in African-American and general readership magazines. *Health Communications, 21*(3), 289-297.

Keating, D., & Hertzman, C. (Eds.). (1999). *Developmental Health and the Wealth of Nations.* NY: The Guilford Press.

Kial, B. (1992). *Special Problems on Non-compliance among Elderly Women of Color.* Lewiston, NY: Edwin Mellen.

Kim, D., Subraman, S., Gortmaker, S., & Kawachi, I. (2006). US state and county level social capital in relation to obesity and physical inactivity: A multilevel, multivariable analysis. *Social Sciences and Medicine, 53*, 1045-1069.

Kimm, S., & Obarzanek, E. (2002). Childhood obesity: A new pandemic of the new millennium. *Pediatrics, 110*(5), 1003-1007.

Krukowski, R., West, D., Perez, A., Bursac, Z., Phillips, M., & Racynski, J. (2009). Overweight children, weight-based teasing and academic performance. *International Journal of Pediatric Obesity, 4,* 271-280.

Lang, T., & Rayner, G. (2006). Overcoming policy cacophony on obesity: An ecological public health framework for policymakers. *Obesity Reviews, 8*(Supp. 1), 165-181.

Laser, J., & Leibowitz, G. (2009). Promoting positive outcomes for healthy youth development: Utilization social capital theory. *Journal of Sociology and Social Welfare, 36*(1), 87-107.

Lee, J., Sheer, J., Lopez, N., & Rosenbaum, S. (2010). Coverage of obesity treatment: A state by state analysis of Medicaid and state insurance laws. *Public Health Reports, 125*, 596-604.

Levi, J., Juliano, C., & Segal, L. (2006). *F as in Fat: How Obesity Policies are failing in America 2006.* Washington, DC: Trust for Americans Health.

Li, L., Dibley, D., Sibbritt, D., & Yang, H. (2006). Factors associated with adolescents' physical inactivity in Xi-an City, China. *Medical Science and Sports Exercise, 38*, 2071-2085.

Li, J., & Hooker, N. (2010). Childhood obesity from schools: Evidence from the national survey of children's health. *Journal of School Health, 80*(2), 96-103.

Lindstrom, M., Moghaddassi, M.,& Merlo, J. (2003) Social capital and leisure time activity: A population based multilevel analysis in Malmo, Sweden. *Journal of Epidemiology and Community Health, 57*, 23-28.

Lufiyya, M., Garcia, R., Dankwa, C., Young, T., & Lipsky, M. (2008). Overweight and obese prevalence rates in African-American and Hispanic children: An analysis of data from the 2003-2004 National Survey of Children's Health. *African-American and Hispanic Childhood Obesity, 21*(3), 191 -199.

Lumeng, J., Gannon, K., Cagral, H., Frank, D.,& Zuckerman, B.(2003). Association between clinically meaningful behavior problems and overweight in children. *Pediatrics, 112*(5), 1138-1144.

Mahoney, J. L., Lord, H., & Carryl, E. (2005). Afterschool program participation and the development of child obesity and peer acceptance. *Applied Developmental Science, 9*(4), 202-215.

McFarlane, J., Scott, H., Robertson, V., Gleeson, C., Vanderkroft, D., & Wilson, K. (2009). General practitioner and paediatrician self-reported capacity for the diagnosis and management of childhood and adolescent overweight and obesity. *Nutrition and Dietetics, 66*, 176-185.

Miller, K. (2007). Risk and resilience among African-American children of incarcerated parents. *Journal of Human Behavior in the Social Environment, 15*(2/3), 25-27.

Moran, R. (1999). Evaluation and treatment of childhood obesity. *American Family Physician, 59*(4), 1-12.

Murnan, J., Price, J., Telljohann, S., Dake, J., & Boardley, D. (2006). Parents' perception of curricular issues affecting children's weight in elementary schools. *Journal of School Health, 76*(10), 502-512.

Mushi-Brunt, C., Haire-Joshu, D., Elliot, M., & Brownson, R. (2007). Fruit and vegetable intake and obesity in preadolescent children: the role of neighborhood poverty and grocery store access. *American Journal of Health Education, 38*, 268-283.

Must, A. (1996). Morbidity and mortality associated with elevated body weight in children and adolescents. *American Journal of Clinical Nutrition, 63*, 445-447.

Must, A., & Strauss, R. (1999). Risk and consequences of childhood and adolescent obesity. *International Journal of Obesity, 23*(Suppl.), 2-11.

Macintyre, S. (2007). Deprivation amplification revisited; or, it is always true that poorer places have poorer access for health diets and physical activities. *International Journal of Behavior Nutrition and Physical Activity, 4*(32). Retrieved from http://www.Ijbnpa.org /content/4/1/32

McLean, T. R. (2003) McFat litigation: New York dismisses first fast food lawsuit. *Journal of Controversial Medical Claims, 10*(4), 11-13.

McCreary, D., Saucer, D., & Courtenay, W. (2005). The drive for muscularity and masculinity: testing the associations among gender-role traits, behaviors, attitudes, and conflict. *Psychology of Man and Masculinity, 6*(2), 83-94.

Moir, J. (2007). Fat kids? Go for your life. *Policy, 22*(4), 35-38.

National Association of Social Workers (2008). *Code of Ethics*. Retrieved from http://www.naswdc.org/pubs/code/code.asp

National Center for Health Statistics. (2008). *FASTATS: Obesity prevalence.* Retrieved from http://www.cdc.gov/nchs/fastats/overwt.htm

National Survey of Children's Health (2011). Learn about the surveys. Retrieved from http://www.nschdata.org/Content/LearnAboutTheSurvey.aspx#

Nestle, M., & Nickerson, M. (2000). Halting the obesity epidemic: A public health policy approach. *Public Health Reports, 115*(1), 12-24.

Nyholm, M., Gullberg, B., Merlo, J., Lundqvist-Persson, C., Rastem, L., & Lindblad, U. (2007). The validity of obesity based on self reported weight and height: Implications for population studies. *Obesity, 15*, 197-208.

O'Dea, J. (2008). Gender, ethnicity, culture, and social class influences on childhood obesity among Australian schoolchildren: Implications for treatment, prevention, and community education. *Health and Social Care in the Community, 16*(3), 282-290.

O'Dea, J., & Caputi, P. (2001). Association between socioeconomic status, weight, age, and gender, and the body image and weight control practice of 6 to 19 year-old children and adolescents. *Health Education Research, 16*(5), 521-532.

Olshanaky, S., Passaro, D., Hershow, R., Layden, J., Carnes, B., Brody, J., et al. (2005). A potential decline in life expectancy in the United States in the twenty-first century. *New England Journal of Medicine, 351*, 1138-1145.

Palloni, A., Milesi, C., White, R., & Turner, A. (2009). Early childhood health, reproduction of economic inequalities and the persistence of health and mortality differentials. *Social Science and Medicine, 68*, 1574-1582.

Pearce, M., Boergers, J., & Prinstein, M. (2002). Adolescent obesity, overt and relational peer victimization, and romantic relationships. *Obesity Research, 10*, 386-393.

Pinhas-Hamlet, O., Singer, S., Pilpel, N., Modan, D., & Reichman, B. (2006). Health-related quality of life among children and adolescents: association with obesity. *International Journal of Obesity, 30*, 267-272.

Portes, A. (1998). Social Capital: Its origins and applications in modern sociology. *Annual Reviews of Sociology, 24*(1), 1-24.

Pronk, N., Tan, A., & O'Connor, P. (2009). Obesity, fitness, willingness to communicate and health care costs. *Medical Science Sports Excerpts, 31*(11), 1535-1543.

Putnam, R. (2000). *Bowling Alone: The collapse and revival of American community.* New York: Simon and Schuster.

Rahman, T., Cushing, R.,& Jackson, R. (2011). Contributions of built environment to childhood obesity. *Mount Sinai Journal of Medicine, 78*, 49-57.

Ramstetter, C., Murray, R., & Garner, A. (2010). The crucial role of recess in schools. *Journal of School Health, 80*(11), 517-526.

Regan, G., Lee, R., Booth, K., & Reese-Smith, J. (2006). Obesogenic influences in public housing: A mix-method analysis. *American Journal of Health Promotion, 20*(4), 282-290.

Reifsnider, E., Flores-Vela, A., Beckman-Mendez, D., Nguyen, H., Keller, C., & Dowdall-Smith (2006). Perceptions of children's body sizes among mothers living on the Texas-Mexico border. *Public Health Nursing, 23*(6), 488-495.

Richardson, L., & Norris, M. (2010). Access to health and health care: How race and ethnicity matter. *Mount Sinai Journal of Medicine, 77*, 166-177.

Rogers, J. (2003). Living on the fat of the land: How to have your hamburger and sue it too. *Washington University Law Quarterly, 81*, 859-883.

Rosenbloom, A., Joe, J., Young, R., & Winter, W. (1999). Emerging epidemic of type 2 diabetes in youth. *Diabetes Care, 22*(2), 345-354.

Sallis, J., & Glanz, K. (2009). Physical activity and food environments: Solutions to the obesity epidemic. *The Milbank Quarterly, 87*(1), 123-154.

Salsberry, P., & Reagan, P. (2009). Comparing the influence of childhood and adult economic status on midlife obesity in Mexican American, White, and African American Women. *Public Health Nursing, 26*(1), 14-22.

Schwimmer, J., Burwinkle, T., & Varni, J. (2003). Health related quality of life of severely obese children and adolescents. *Journal of American Medical Association, 289*(14), 1813-1819.

Simen-Kapeu, A., & Veugelers, P. (2010). Should public health interventions aimed at reducing childhood obesity and overweight and obesity be gender-focused. *BMC Public Health, 10*(340), 1-7.

Slater, S., Ewing, R., Powell, L., Chaloupka, F., Johnston, L., & O'Malley, P. (2010). The association between community physical activity settings and youth physical activity, obesity, and body mass index. *Journal of Adolescent Health, 47*, 496-501.

Snethen, J., Hewitt, J., & Petering, D. (2007). Address childhood overweight: Strategies learned from one Latino community. *Journal of Transcultural Nursing, 18*(4), 366-372.

Strauss, C., Smith, K., Frame, C., & Foremen, R. (1985). Personal and interpersonal characteristics associated with childhood obesity. *Journal of Pediatric Psychology, 7*, 327-334.

Strauss, R., & Knight, J. (1999). Influence of the home environment on the development of obesity in children. *American Academy of Pediatrics, 103*(6), 85-92.

Strauss, R., & Pollack, H.(2003). Social marginalization of overweight children. *Archives of Pediatrics and Adolescent Medicine, 157*, 746-752.

Story, M., Nanney, M., & Schwartz, M. (2009). School and obesity prevention: creating school environments and policies to promote healthy eating and physical activity. *Milbank Quarterly, 87*(1), 71-100.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson.

Taras, H., & Potts-Daterma, W. (2005). Obesity and student performance at school. *Journal of School Health, 75*(8), 291-295.

Thompson, V., Baranowski, T., Cullen, K., Rittenberry, L., Baranowski, J., Taylor, W., & Nicklas, T. (2003). Influences on diet and physical activity among middle-class African-American

8- to 10-year old girls at risk of becoming obese. *Journal of Nutrition Education Behavior, 35*, 115 -123.

Tucker, L., & Friedman, G. (1998). Obesity and absenteeism: an epidemiology study of 10,825 employees. *American Journal of Health Promotion, 12*(3), 202-207.

United States Census Bureau. (2011). *Income, poverty, and health insurance.* Retrieved from http://www.census.gov/hhes/www/income/income.html

United States Department of Education. (2007). *Digest of health statistics; 2007.* Retrieved from http://nces.ed.gov/programs/digest/d07/tables/dt07_006.asp?referrer=list

United States Department of Health and Human Services. (2006). *2006 National Healthcare Disparities Report*. Retrieved from http://www.ahrq.gov./qual/nhdr06/nhdr06high.pdf

United States Department of Health and Human Services. (2010). *The Surgeon General's call to action to prevent and decrease overweight and obesity.* Retrieved from http://www.surgeongeneral.gov/topics/obesity/

United States Department of Health and Human Services. (2009). *Healthy people 2010.* Retrieved from http://www.healthypeople.gov/Default.htm

Urrutia-Rojas, X., Ahmad, N., Bayona, M., Bae, S., Rivers, P., & Singh, K. (2008). Risk factors associated with obesity in children of different racial backgrounds. *Health Education Journal, 67(*2), 121-133.

Varni, J., Limbers, C., & Burwinkle, T. (2007). Impaired health-related quality of life in children and adolescents with chronic conditions: a comparative analysis of 10 disease clusters and 33 disease categories/severities utilizing the PedsQL 4.0 Generic Core Scales. *Health and Quality of Life Outcomes, 5*(43), 1-15.

Vartanian, L., Giant, C., & Passino, R. (2001). Ally McBeal vs. Arnold Swhwarzenegger: Comparing mass media, interpersonal feedback and gender as predictors of body thinness and muscularity. *Social Behaviors and Personalities, 29*(7), 711 –723.

Veenstra, G., Luginaah, I., Wakefield, S., Birch, S., Eyles, J., & Elliot, S. (2004). Who you know, where you live: Social capital, neighbourhood, and health. *Social Science and Medicine, 60*, 2799-2818.

Veugelers, P, Sithole, F., Zhang, S., & Muhajarine, N. (2008). Neighborhood characteristics in relation to diet, physical activities and overweight of Canadian children. *International Journal of Pediatric Obesity, 3,* 152-159.

Vieweg, V., Johnston, C., Lanier, J., Fernandez, A., & Pandurangi, A. (2007). Correlation between high risk obesity groups and low socioeconomic status in school children. *Southern Medical Association, 100*(1), 8-13.

Warschburger, P. (2005). The unhappy obese child. *International Journal of Obesity, 29*, 5127-5129.

Wells, N., & Yang, Y. (2007). Neighborhood design and walking: A quasi-experimental longitudinal study. *American Journal of Preventive Medicine, 31*, 464-474.

Whitaker, R., Wright, J., Pepe, M., Seidel, K., & Dietz, W. (1997). Predicting obesity in young adulthood from childhood and parental obesity. *New England Journal of Medicine, 337*, 869-873.

Wooley, M., Grogan-Kaylor, A., Gilsterm M., Karb, R., Gant, L., Reischl, T., & Alaimo, K. (2008). Neighborhood social capital, poor physical conditions, and school achievement. *Children & School, 10*(3), 133-145.

World Health Organization (2001). *International classification of function, disability, and health: short version.* Geneva Switzerland: Author.

Wijga, A., Scholtens, S., Bernelmans, W., Jongste, J., Kerkhof, M., Schipper…Smit, H. (2010). Comorbidities of obesity in school children: a cross-sectional study in the PIAMA birth cohort. *BMC Public Health, 10*, 1-10.

Winterfield, A. (2005). Overfed but undernourished, *State Legislatures, April*, 34-36.

Zenk, S., Schulz, A., & Israel, B. (2005). Neighborhood racial composition, neighborhood poverty, and the spatial accessibility of supermarkets in metropolitan Detroit. *American Journal of Public Health, 95*, 660-667.

Zeller, M., Roehrig, H., Modi, A., Daniels, S., & Inge, T. (2006). Health related quality of life and depressive symptoms in adolescents with extreme obesity presenting for bariatric surgery. *Pediatrics, 117*(4), 1151-1161

BIOGRAPHICAL INFORMATION

Shing Pang was born in Hong Kong and came to the United States when he was 9 years old. He has an eclectic education and employment history. He graduated with a Bachelors in Electrical Engineering from the University of Texas at Arlington in 1985, a Medical Degree from the University of Texas Health Science Center at San Antonio in 1990, a Master's of Science in Social Work from the University of Texas at Arlington in 2006, and a PhD in Social Work from the University of Texas at Arlington in 2012. He has worked as an electrical engineer, physician, and social worker.

Shing's research interest include medical aspects of social work and had published articles and presented at conference concerning childhood obesity. In his spare time, he enjoys reading classical novels by acclaimed authors, learning about the newest approaches to medical care, and playing chess.