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CHARACTERISTICS IN THE HOME THAT CONTRIBUTE TO CHILDHOOD OBESITY

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Child Development

by
Amanda Nicole Ferguson
June 2012
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5/23/2012
Date
ABSTRACT

The prevalence of childhood obesity is a growing problem in the United States. Overweight and obese children are at risk for numerous adverse health outcomes such as, Type-2 diabetes, sleep apnea, and hypertension. An ecological approach was used in this study to investigate possible contributors to childhood obesity. Socio-economic status and home nutritional characteristics (i.e., fast food consumption, fruit and vegetable consumption, and days per week dinner was eaten as a family) were examined as predictors of children’s body mass index. Participants consisted of 353 youth, aged 2-17, residing in Eastern Riverside County, CA. Secondary analyses of data collected in 2010 was conducted using structural equation modeling. The hypothesized model proposed that socio-economic status would predict home nutritional characteristics and that home nutritional characteristics would predict body mass index scores. This model was weakly supported. Post hoc modifications were made to the model. In the modified model, socio-economic status significantly predicted body mass index scores. Further research is needed to investigate mediator(s) between socio-economic status and childhood obesity.
ACKNOWLEDGMENTS

I would like to thank my thesis advisor and mentor, Dr. Sybil Carrère. I am grateful for all of the time that she has invested in me, and my research interests, over the past few years that I have been working with her. Her guidance, patience, and encouragement has helped motivate me to set and attain high educational goals for myself.

I am also grateful for the expertise and support that my thesis committee members have provided me throughout this process. As my statistics expert, Dr. Riggs has been a tremendous help in teaching me how understand and apply statistics in a meaningful way. Dr. Haddock, who served as my authority on the topic of childhood obesity, helped guide my research by providing his knowledge on the topic.

I would like to thank my family. I would like to thank my husband, Reggie, for all of the support that he has provided me throughout this journey. His reassurance, calm demeanor, and sense of humor has helped me tremendously. My sisters have been such great role models; they have shown me that anything is possible if you work hard enough. I am grateful that I have had them as role models. My mom is the most intelligent, caring woman I know. I thank her for being her. To my dad, I am thankful
for everything. I thank him for showing me the importance of an education and for supporting all of my decisions.

I have been fortunate to have all of these people influence me in different aspects of my education. I appreciate the time that each of them has invested in me throughout this journey.

Lastly, data used in the thesis were provided by the Health Assessment Resource Center (HARC), in Eastern Riverside County, CA, Palm Desert. Any mistakes in the analyses, presentation of information, or content of the publication/presentation are the sole responsibility of the authors and not of HARC. The work on this thesis was funded by a grant from the National Institute of Minority Health and Health Disparities (5 P20 MD 002722) to California State University, San Bernardino.
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CHAPTER ONE
INTRODUCTION

Childhood obesity is an epidemic in the United States that has steadily increased for decades. Between 1976-1980 and 2007-2008 the prevalence of obese children aged 2-5 years rose from 5% to 10.4%. For children aged 6-11, the prevalence of obese children rose from 6.5% to 19.6% between 1976-1980 and 2007-2008 (Ogden & Carroll, 2010). The increased prevalence of obesity that has occurred since the 1970’s represents a dramatic increase that can hinder a child’s developmental trajectory. Furthermore, according to a report by the Centers for Disease Control, between 1992 and 1994 14% of US children aged 6-19 years were overweight and 11% were obese. Between 1999 and 2002 the Centers for Disease Control reported that 31% of US children aged 6-19 years were overweight and 16% were obese (Lee, 2007). The amount of children who were overweight doubled between 1992-1994 and 1999-2002 and, the amount of children who were obese rose significantly.

Among children that are overweight and obese, African American and Hispanic children are affected more than other racial/ethnic groups (Lee, 2007). This is a relatively new trend. When a nationally representative
data set was analyzed from 1988-1994 researchers found no statistical difference in the prevalence of obesity for adolescent Mexican-American males (14.1%), African-American males (10.7%), or European-American males (11.6%). When the same data set was analyzed for 2007-2008 researchers found the prevalence for obesity was 26.8% for adolescent Mexican-American males, 19.8% for adolescent African-American males, and 16.7% for European-American adolescent males (Ogden & Carroll, 2010). Although the prevalence of obese European-American adolescent males did increase 5.1%, the increase for Mexican-American and African-American adolescent males rose more, 12.7% and 9.1% respectively. The increase in the prevalence of obesity for minority populations represents a health disparities issue as childhood obesity has impacted minority groups more than non-minority groups.

The purpose of this thesis is to investigate the relationship between rates of childhood obesity (i.e., determined by children's body mass index, BMI), children's socio-economic status (SES), and their home characteristics (i.e., frequency of meals eaten as a family, fruit and vegetable consumption, and fast food consumption). The current thesis will take an ecological perspective, which is an integrative way to research the
environment that children develop in. I will first introduce key thesis components and ecological theory. Next, I will review previous research that integrates and explores the key thesis components.

Introduction to Key Components and Theory

Childhood Obesity

The Centers for Disease Control and Prevention (CDC) recommend that children who are obese have a BMI that is greater than the 95th percentile, while children who are overweight have a BMI over the 85th percentile and under the 95th percentile (Lee, 2007). A child's BMI is calculated by using their weight and height (Ogden & Flegal, 2010; Rosner, Prineas, Loggie, & Daniels, 1998). Between the ages of 2 and 17 a percentile rank is used to determine if a child is obese (≥ 95th percentile), overweight (85th through < 95th percentile), at a healthy weight (5th through < 85th percentile), or underweight (< 5th percentile). The percentile rank takes into consideration the child's sex and age because during childhood height and weight varies with age and sex (Ogden & Flegal, 2010). Once an individual is 18, the BMI number is used to determine if an individual is of a healthy weight (i.e., a percentile ranking is no longer used).
Using BMI as a measure of obesity has become a standard practice because a child's height and weight is routinely recorded at a physician's office. Research has shown that the inter-rater reliability of measuring height and weight is stronger than using a measure of triceps skinfold thickness (Dietz & Robinson, 1998). Furthermore, when comparing BMI to dual energy x-ray absorptiometry (DXA) the correlation ranged from .79 to .83 in males and females aged 5-19 (Dietz & Robinson, 1998). Additionally, when Pietrobelli and colleagues (1998) compared the use of BMI and DXA they reported that BMI is a valid estimate of body fatness for children.

Children who are obese increase their risk of facing life-long health problems. They are more likely to face early-onset type 2 diabetes, glucose intolerance, insulin resistance, hypertension, sleep apnea, cardiovascular disease as adults, and orthopedic problems as adults when compared to children who are not obese (Lee, 2007). Since childhood obesity tends to impact African Americans, Hispanics, and individuals who live below the poverty line more than other racial/ethnic groups and people who live above the poverty line (Olson, Bove, & Miller, 2007; Powell, Chaloupka, & Bao, 2007), they are at a higher risk of developing the health problems associated with obesity.
Although previous research has shown that there is a relationship between race/ethnicity and the prevalence for obesity, the current study will focus on the relationship between socio-economic status and obesity.

**Socio-Economic Status**

Socio-economic status (SES) can be defined as an individual’s, or family’s, social standing in their community. It can be determined by one’s education level, occupation, annual income, etc. For the current study, SES will be determined by a family’s annual household income and parental education. Previous research on how SES impacts childhood obesity has yielded mixed results. For example, while Taylor, Viner and colleagues (2005) found statistically significant differences between ethnic groups and BMI they found no relationship between SES and childhood obesity within their sample of adolescents aged 11-14 years. In contrast other researchers have found that children who grow up in households below the poverty line are at a higher risk for obesity and being overweight than children who grow up in households above the poverty line (Olson, Bove, & Miller, 2007; Stamatakis, Wardle, & Cole, 2010).
Ecological Theory

The ecological theory, first proposed by Urie Bronfenbrenner (1979), suggests that development and change occurs as a result of interactions between an individual and their environment. Suggesting that there is a reciprocal relationship between the individual (i.e., a child) and their environment (i.e., home environment or neighborhood environment) where each affects the other is an important way to view development as children develop in various settings. The environment that an individual grows up in can change their developmental trajectory. For example, if a child is developing in an environment that only provides a high caloric diet, she will be at risk for becoming overweight even if genetically, her family is prone to healthy weight. This present example demonstrates the nature (i.e., genetic component) and nurture (i.e., environmental component) interaction.

The ecological theory proposes that there are four subsystems that interact with each other to influence an individual’s development; they are the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1979). The microsystem consists of settings that a child is directly influenced by, such as her home environment. The mesosystem consists of relationships between settings
that influence a child, such as her neighborhood. The exosystem consists of settings that do not contain the child but indirectly influence her, such as her parent's employment status. The macrosystem represents societal norms, values, and laws; it provides a context for the other systems (Bronfenbrenner, 1979). Previous research has shown that characteristics within subsystems can put children at risk for becoming obese (Davison & Birch, 2001).

The key components presented here (i.e., childhood obesity, SES, and ecological theory) should not be viewed independently. In the next section I will discuss these key components of my thesis research and integrate them into three of the subsystems within the ecological theory (i.e., exosystem, mesosystem, and microsystem).

Integration of Key Theory Components

Each subsystem of the ecological theory interacts with the other subsystems; they should not be viewed individually. As children take part in their daily activities they will often encounter each subsystem multiple times. For example, a child may begin his day in the microsystem, at home, eating breakfast with his family. He may then interact with the mesosystem, at
school, where he may engage in physical activity, talk with his friends, and eat lunch. Once he returns home he will again interact with the microsystem (i.e., his family) during dinner. Throughout his daily interactions he will be constantly influenced by the exosystem. The SES of his family will influence the foods he eats and neighborhood he lives in. In the following sections I will further discuss how the different subsystems interact with each other to impact a child’s weight.

Exosystem: Socio-Economic Status

A large number of studies would suggest that childhood obesity is a health disparity issue because it affects people who live below the poverty line disproportionately (Murasko, 2009; Singh, Kogan, Van Dyck, & Siapush, 2008). When Singh and colleagues (2008) examined the relationship between SES and other variables such as social capital and ethnic minority status they found that SES was associated with higher rates of obesity in children. Specifically, children from low SES families were 3.7 times more likely to be obese than children from higher SES families. While examining the correlation between SES and childhood obesity in Chesterfield County, Virginia, researchers found that although the prevalence of obesity was found across all socio-economic statuses,
the prevalence of obesity was highest in children from low SES environments (r-value ranged from .565-.842; Vieweg, Johnston, Lanier, Fernandez, & Pandurangi, 2007).

When researchers investigated children in a rural Louisiana region, they found that of the 2,709 participants, 77% were low SES (i.e., as determined by receiving free lunch at school). The researchers found that 17.7% of the children in the study were overweight and 27.45% of the children in the study were obese, as determined by their BMI. The majority of the children had BMI scores that were at the 98th and 99th percentile, which is very high (Williamson, Champagne, Han, et al., 2009).

A separate study found staggering differences between living in poverty and being obese as a child. Specifically, it was reported that in Chicago’s north side the obesity rate was 11.8% (compared to the national average of 16.8%); this area had a median income of $53,000. In Chicago’s south side, the obesity rate was 56.4%; the median household income in the south side was $35,000 (Margellos-Anast, Shah, & Whitman, 2008). The disproportionate differences in rates of obesity based on geographic location demonstrate how an individual’s location and SES can influence obesity rates.
In contrast to the studies that indicate a greater rate of obesity among children living in poverty, when Zhang and Wang (2007) evaluated how the relationship between SES and childhood obesity has evolved over the past several decades (i.e., 1970’s-2000’s) they found that the more recent the data was (i.e., 1990’s-2000’s) the greater the percentage of children and adolescents who were obese, as determined by their BMIs, in all SES statuses. This research suggests that the prevalence of obesity has become an epidemic that impacts many children and adolescents, regardless of SES.

An additional, disturbing trend in the data reveals that the developmental period (i.e., infancy, toddlerhood, early childhood, etc.) during which an individual lives in poverty may also contribute to becoming obese as an adult. In one study, researchers found that individuals who lived in poverty during infancy (i.e., annual household income less than $25,000) were more likely to be obese as adults when compared to individuals who did not live in poverty (i.e., annual income greater than $25,000) during infancy (Ziol-Guest, Duncan, & Kalil, 2009). Furthermore, a review of literature published between 1998-2008 found that females who experienced poverty in childhood were more
likely to be obese as adults (Sense, Almedia, Fath, Smith, & Loucks, 2009).

Many studies that examine SES also examine race and ethnicity. One reason for this is that there tends to be a strong correlation between race/ethnicity and SES. Research has also shown that a second reason race and SES are often examined together within health disparities research is that in the United States many neighborhoods are racially segregated (LaVeist, 2005). This makes it difficult to disentangle race and SES when examining health outcomes. Although there is a strong, overlapping relationship between SES and race/ethnicity, both variables are independent of each other (LaVeist, 2005).

Given that race/ethnicity and SES are two independent predictors, the current study will examine the impact that SES has on childhood obesity.

The reviewed studies are a few examples that represent the relationship between SES and childhood obesity. Research has shown that childhood obesity affects all SES statuses although it tends to affect people in the low SES status more than people in the high SES status. It is important to research the impact of childhood obesity as a poverty-related health disparity issue because its
consequences can adversely affect one's quality of life both as a child and an adult.

**Mesosystem: Access to Healthy Foods**

**Fast Food Consumption.** Research has shown that there is a correlation between growing up in low SES environments and an increased risk of children becoming overweight and obese (Olson, Bove, & Miller, 2007). Part of the reason for this may be because there tends to be more fast food restaurants in low-income neighborhoods (i.e., a mesosystem factor that has influence on the microsystem). Researchers have reported that low-income neighborhoods have the highest number of fast food restaurants when compared to high-income neighborhoods (Powell, Chaloupka, & Bao, 2007; Smoyer-Tomic et al., 2008). In East Harlem researchers examined the neighborhood characteristics (i.e., as determined by census blocks) for over 300 6-8 year old children. Sixty percent of households surveyed had an annual income level less than $24,999 while an additional 30% of households reported their annual income to be between $25,000 and $49,000. Researchers found that convenience stores were located in 55% of the census blocks and fast food outlets were located in 41% of the census blocks. Furthermore, children who had convenience stores in their census blocks
tended to have higher BMI percentiles than children without convenience stores in their census blocks (Galvez et al., 2009).

Powell and colleagues (2007) also reported that neighborhoods whose residents were predominately African American had 59% more fast food restaurants when compared to neighborhoods whose residents were predominately European American. In Los Angeles one of the communities with the highest rates of childhood obesity is East Los Angeles (4.4 square miles). When examining this region (i.e., East Los Angeles), researchers found that 94% of the food outlets were fast food outlets. Of the 62 grocery stores in the community 18% sold fresh fruits and vegetables. Sixty-three percent of the fast food outlets were within walking distance of schools while four of the grocery stores that sold fresh fruits and vegetables were within walking distance to schools (Kipke et al., 2007). This study demonstrates how access to unhealthy foods versus healthy foods is associated with greater rates of childhood obesity.

Data from a nationally representative sample of over 6,000 children has shown that children aged 4-19 years who eat fast food consume, on average, 770 more calories per day when compared to children who do not eat fast food
(McCaffrey et al., 2006). McCaffrey and colleagues (2006) reported that on average 30% of the children in the study ate fast food each day. Furthermore, children who eat fast food consume more fat, carbohydrates, added sugars, less milk, and fewer vegetables when compared to children who do not eat fast food (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004).

The relationship between fast food consumption and childhood obesity is important to study because eating fast food is likely a key contributor to childhood obesity, especially for those children who live in low SES environments.

**Microsystem: Home Characteristics**

Research has shown that the microsystem can impact childhood obesity to a great extent. For example, if a child’s home environment (i.e., microsystem) consists of characteristics that include a high caloric diet and sedentary activities he or she is at a higher risk for becoming obese. Researchers using an ecological perspective have found that characteristics within the home (i.e., diet, physical activity, acculturation) were significantly related to childhood obesity (Elder et al., 2010).
Family Meal Frequency. A contributing factor to childhood obesity is the frequency of time a family spends eating meals together (i.e., eating breakfast, lunch, or dinner). Fifty-five percent of married parents and 47% of single parents report eating breakfast with their preschool child on a daily basis (Savage, Fisher, & Birch, 2007). McCaffrey et al., (2006) reported that children and adolescents who eat dinner with their families on a regular basis are less likely to be overweight and are more likely to develop healthy eating habits, when compared to children and adolescents who do not eat dinner with their families on a regular basis.

Research using a national sample has examined the impact that family meal frequency has on different races and socio-economic statuses. It was found that European-American children, aged 6-11 years, who ate meals with their families daily, were less likely to be obese when compared to those who ate family meals a few times per week. For African-American males, aged 6-11 years, an increase in family meal frequency also served as a protective factor against obesity. For low SES Hispanic males, between the ages of 6-11 years, a low family meal frequency put them at risk for becoming obese (Rollins, Belue, & Frances, 2010). In addition to family meal
frequency, the types of social interactions that occur during mealtime appear to be an important factor. For instance, positive family interactions during mealtime mediates the relationship between family stressors and child weight by providing a supportive environment (Lytle et al., 2011).

A recent study by Ayala (2010) examined a two-year follow up of a microsystem intervention that included the promotion of increasing the frequency of family mealtimes, increasing physical activity, and overcoming perceived parental barriers to eating healthier food. Ayala found that, over the two-year time period, improving these micro-environmental aspects of a child’s environment lowered the child’s risk for becoming obese (2010). A separate study that looked at a 10-year follow up of children who participated in family-based treatments for obesity found that 30% of the youth in the study were not overweight and 34% reduced their body fat by 20%. One key component of their family-based treatment was eating meals at home (Epstein, Valoski, Wing, & McCurley, 1994). These findings are important because they demonstrate that increasing the frequency that a family spends eating meals together can be an important factor in lasting weight loss.
In a study examining youth at-risk for academic failure and frequency of eating family meals researchers found, that the at-risk adolescents who reported never eating dinner with their families were more likely to be overweight when compared to at-risk adolescents who reported eating dinner with their family five to seven times per week (Fulkerson, Kubik, Story, Lytle, & Arcan, 2009).

When children eat with their families, and engage in quality interactions, they typically eat slower, learn to follow internal satiety cues, eat more fruits and vegetables, and eat less fast food (McCaffrey et al., 2006). These social behaviors are important factors for all children to learn so they can learn to lead a healthy lifestyle. Research has shown that these techniques help reduce one’s risk for becoming obese immediately as well as remaining obese over the long term.

Fruit and Vegetable Consumption. Consuming fruits and vegetables are important factors of eating a balanced diet and reducing childhood obesity. Research has shown that obese children consume more fat, sugar, and calories while consuming less fruits and vegetables than non-obese children (Garipagaoglu et al., 2008). This is a trend that is not only seen in the United Stated but in other
countries as well. For Mexican residents fruit and vegetable consumption was negatively correlated \((r = 0.47)\) with high BMI scores for both school-aged children and their parents (Vergara-Castaneda, Castillo-Martinez, Colin-Ramirez, & Orea-Tejeda, 2010).

Research has shown that the transition from childhood to adolescence is a particularly troubling time for healthy eating. This five-year (i.e., ages 9-14) transitional period is marked by a decrease in fruit and vegetable consumption, an increase in fast food consumption, and an increase in unhealthy snacking for both males and females. In addition, individuals in this age group with higher BMI's tended to consume more fast food than individuals with lower BMIs (Bisset, Gauvin, Potvin, & Paradis, 2007).

Related research by Fulkerson and colleagues (2009) found a positive correlation between frequency of eating family dinner and consumption of fruit, the more family dinners at-risk youth participated in, the more fruit they were likely to eat. It is important to study the correlation between the frequency of meals eaten as a family and childhood obesity because previous research has shown that critical behaviors are modeled for children and adolescents during family meals, even when those youth are
at-risk for academic failure (Fulkerson et al., 2009; McCaffrey et al., 2006). Fruit and vegetable consumption is an important variable to evaluate when examining childhood obesity because previous research has shown that those who consume fruits and vegetables often weigh less than those who do not (Garipagaoglu et al., 2008).

When evaluating the childhood obesity epidemic it is important to examine other variables such as frequency of family meals eaten together and fast food consumption as research has shown that these variables are correlated with each other (Bisset et al., 2007; Fulkerson et al., 2009). To get a holistic view of food-related aspects within a child’s microsystem, the amount of fruits and vegetables consumed per day, amount of fast food consumed per week, and family meal frequency will be examined in the current thesis.

Intersection of Ecological Levels

Although the levels of the ecological system can be viewed independently they can also be viewed as being integrative as well as interchanging. For example, in the current study even though fruit and vegetable consumption and fast food consumption are components of the microsystem they are highly influenced by and dependent on
characteristics in the mesosystem. The access to fruits and vegetables and fast food that one has available in their neighborhood (i.e., their mesosystem) is directly related to the amount of fruits and vegetables and fast food they will consume. In the present example the mesosystem and microsystem intersect with each other.

When examining childhood obesity from an ecological perspective it is important to keep in mind how integrative the levels are with each other and how each level and characteristics within each level intersect with each other. This perspective will provide a more holistic view of the childhood obesity epidemic.

Summary

Childhood obesity is influenced by characteristics in a child’s microsystem, such as family meal frequency and fruit and vegetable consumption. It is also influenced by a child’s mesosystem, through the availability of fast food restaurants. Lastly, childhood obesity is influenced by a child’s exosystem, through the family’s SES. Because childhood obesity is influenced by so many environmental factors it is important to research it with an ecological perspective.
Including all three levels of the ecological model is a valuable way to examine childhood obesity because children live and develop in many different settings. Taking a multi-level approach to obesity research is an approach that is not often used. The proposed thesis will contribute to the study of obesity research as it will examine the contribution of the different components of the ecological system to the association between SES and obesity.

Hypotheses

The purpose of the current thesis is to investigate the relationship between children’s SES, home characteristics (i.e., family meal frequency, fruit and vegetable consumption, and fast food consumption), and rates of childhood obesity (i.e., determined by children’s BMI).

The following hypotheses and research question are proposed:

H$_1$: The condition of children’s SES environments’ will be positively correlated with their home nutritional characteristics that consist of time spent eating dinner as a family, fruit and
vegetable consumption, and fast food consumption.

$H_2$: Children's home nutritional characteristics will be negatively correlated with BMI scores.

The hypotheses fit into previous research by examining the relationships between a child's SES, the characteristics of their home environment, and their BMI. The hypotheses also expand on previous research because none of the reviewed research has looked at all of the factors (i.e., SES, home characteristics, and BMI) with one sample.
CHAPTER TWO

METHODS

Participants

Participants consisted of individuals over the age of 18 who completed the Health Assessment Resource Center (HARC) Eastern Riverside County child survey between January 2010 and March 2010. Overall, 692 people completed the child health survey (HARC, 2011). Completing the child survey indicated that there was a child under the age of 18 living in the household at the time of the interview. Prior to participating in the survey, participants voluntarily gave informed consent and were notified that they could withdraw from the study at any time.

In addition to completing the child health survey, to be included in data analysis participants consisted of individuals who lived in Eastern Riverside County, California at the time of the study. Eastern Riverside County consists of 13 incorporated cities (i.e., Calimesa, Banning, Beaumont, Desert Hot Springs, Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio, Coachella, and Blythe) and one large unincorporated area. Of the respondents who completed the child health survey, those who have a child aged two years
or older are included in data analysis because only households with children over the age of two were asked about the child’s BMI.

The HARC (2011) survey collected extensive demographic information from interviewees. The demographic information included in the data analysis was age of child, sex of child, household income, and parental education. This information was used to analyze a child’s BMI (i.e., age, sex, and weight) and their SES (i.e., household income and parental education).

The sampling strategy was random and probability based; every resident in the Eastern Riverside County had an equal chance of being selected. Stratified random digit dialing was used to contact potential participants, which helped to ensure that every resident with a telephone number had an equal chance of being selected to participate in the HARC Eastern Riverside County survey. Study areas were defined by zip code; based on the zip codes, households were randomly selected to be contacted.

Measures

The questions that were used from HARC’s child health survey and permission from HARC to use their data may be found in Appendix A. The independent variables in the current study were SES (i.e., household income and
parental education) and household characteristics (i.e., frequency of meals eaten as a family per week, fruit and vegetable consumption, and fast food consumption). The dependent variable in the current study was childhood obesity (i.e., as determined by a child’s BMI). As previously noted, data was collected between January 2010 and March 2010, using a phone interview. Participants were selected using random digit dialing.

To measure SES parents were asked the following two questions: “What is the highest grade or year of school you completed?” “What is your annual household income level before taxes?”

To measure the household characteristic fruit and vegetable consumption parents were asked the following question: “Some people do not eat 5 servings of fruits and vegetables in their daily diet, if this is true for your child can you tell me the main reason your child does not eat more fruits and vegetables?” Interviewees had 15 responses to choose from that ranged from the child currently eating enough fruits and vegetables to the child not liking the taste. The questionnaire did not specify if interviewees were able to choose one response or multiple responses. Two of the responses indicated that the parent did not respond or refused to respond, twelve responses
indicated that there was a barrier to eating fruits and vegetables, while one response indicated that the child ate enough fruits and vegetables per day. Based on the responses, this variable was dichotomized to indicate that children ate enough fruits and vegetables per day or, they did not eat enough fruits and vegetables per day.

To measure the household characteristic fast-food consumption interviewees were asked, “Including school lunches, about how many days in the past week did [child] eat fast food such as burgers, fries, tacos, burritos, and pizza?” Answers ranged from none to every day of the week.

To determine the last household characteristic frequency of family meals eaten as a family, interviewees were asked, “How many times a week do you sit down together to eat dinner with your family?” Responses ranged from none to every day.

To measure the child’s BMI parents were asked to report their child’s sex, age, weight, and height. The child’s BMI was then calculated for children aged 2-17 using the child’s weight and height. Once the BMI for a child was calculated the number was plotted on a BMI-for-age-growth chart to get a percentile. The growth chart took into consideration the child’s sex and age, as weight and height fluctuates during childhood. Based on
the child's percentile rank, children were placed into one of four categories: underweight, healthy weight, overweight, or obese. According to the American Medical Association (2007), an underweight child falls below the 5th percentile, a child of healthy weight falls between the 5th percentile and the 85th percentile, a child that is overweight falls between the 85th to 95th percentile, and an obese child is equal to or greater than the 95th percentile. Statistics for children aged 2-5 were grouped together and 6-17 within the HARC data.

**Procedures**

Between January 2010 and March 2010 participants were contacted via telephone, using random digit dialing. Interviewers were trained to ensure consistent, high quality interviewing prior to data collection (HARC, 2011). Throughout the duration of data collection 10% of the interviews were monitored to ensure consistency and quality. Participants were asked to participate in the HARC 2010 Community Health Monitor survey, a 19-minute telephone interview with the goal of collecting health-related data of residents of the Eastern Riverside County. Participants provided verbal consent and were told that they could withdraw from the interview at any time and they did not have to answer any question that they did not want to answer.
not feel comfortable answering. The human subjects approval from California State University, San Bernardino's Institutional Review Board may be found in Appendix B.

Upon providing verbal consent, participants were asked detailed questions about their general health status, including health care access and use, quality of life, social health, and behavioral health. Upon being asked, if participants informed the interviewer that there was a child living in the household, the participant was randomly given the child survey or the adult survey. Information on the adult or child's demographics, general health, health care utilization, health care access, health care coverage, social, mental health, behavioral health, injury prevention, behavioral risk, diet, nutrition, exercise, prevention screening, social needs, emotional needs, child care, and child development were requested (HARC, 2011). Upon completing the interview participants were thanked for their participation. Over 55,000 households were randomly dialed to achieve 3,234 total completed interviews (i.e., child and adults surveys).
CHAPTER THREE

RESULTS

Data Screening

Prior to hypothesis testing, data from the 692 participants were screened using SPSS for assessing missing values, univariate and multivariate outliers, multicollinearity and singularity, and normality of the sampling distribution.

Missing Values Analysis

Participants were removed from the data set if they were missing values on the following variables: height, weight, age and sex, as those were the variables needed to calculate a child’s BMI and percentile ranking. Body mass index was the criterion variable thus it was necessary that all participants have a BMI score calculated. A total of 255 participants were removed from the data set (N = 437).

Using SPSS, a missing values analysis was run on the following variables: income, education, fruit and vegetable consumption, fast food consumption, and amount of days per week dinner was eaten as a family, to determine if the participants that were missing values were systematically different from those that were not
missing values. Results indicated that the missing variables were missing at random (MAR) meaning, the missing data’s pattern was not significantly related to the criterion variable (Tabachnick & Fidell, 2007). The t-tests generated from the missing values analysis were not significant, meaning that the participants with missing data were not systematically different from those that were not missing data. Results of the missing values analysis are listed in Table 1.

Table 1. Missing Values Analysis Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Child’s BMI</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>n Present</td>
<td>n Missing</td>
</tr>
<tr>
<td>Fruit and vegetable consumption</td>
<td>1.4</td>
<td>.170</td>
<td>437</td>
<td>31</td>
</tr>
<tr>
<td>Fast food consumption</td>
<td>0.5</td>
<td>.607</td>
<td>430</td>
<td>38</td>
</tr>
<tr>
<td>Total dinners eaten with family</td>
<td>1.4</td>
<td>.170</td>
<td>437</td>
<td>31</td>
</tr>
<tr>
<td>Annual household income</td>
<td>-1.9</td>
<td>.057</td>
<td>421</td>
<td>47</td>
</tr>
</tbody>
</table>

Note. Variables with less than 5% missing data are not listed. Thus, parental education is not listed.

As a result of missing values being MAR (i.e., the participants with missing values were not systematically different from those that were not missing values), it was determined to delete participants who were missing values on the remaining variables (i.e., income, education, fruit...
and vegetable consumption, fast food consumption, and amount of days per week dinner was eaten as a family; listwise N = 354). For the remaining 354 participants, there were no missing data.

**Univariate and Multivariate Outliers**

Data were screened for univariate outliers, using the standard of z-scores within the range of +/-3.29 and four outliers were found. Three outliers (z = 3.604) were found on the variable fast food consumption in the past seven days. These outliers were not removed from analysis because although their z-score was above 3.29 (z = 3.604) the data points were not discontinuous (i.e., these participants indicated that they consumed fast food eight times in the past seven days). One outlier was found on the child's BMI variable (z = 4.14) and was deleted as the outlier was discontinuous.

Mahalonobis distance was used to identify multivariate outliers (p < .001). No additional outliers were found.

**Normality**

The assumption of normality was not violated. The variables parental education, children's BMI scores and, fruit and vegetable consumption were normally distributed. The variable amount of days per week dinner was eaten as a
family was slightly negatively skewed. The variables fast food consumption in the past seven days and income were slightly positively skewed. It is reasonable to expect skewness within the variables that were skewed so no transformations were necessary.

**Multicollinearity and Singularity**

Using all construct variables as predictors of child's BMI, a multiple regression was run to assess collinearity. None of the tolerance levels were below .740. Tolerance is to be considered problematic if it goes below .10). Furthermore, the construct variables were not correlated above $r = .90$, the recommended standard (Tabachnick & Fidell, 2007). A final sample of 353 participants was used for analysis.

**Hypothesized Model**

Using EQS, a structural equation modeling (SEM) analysis was performed based on the acquired data. The hypothesized model is presented in Figure 1 where rectangles represent measured indicators (i.e., variables that were directly measured) and circles represent latent indicators (i.e., variables that were not directly measured). A single-headed arrow represents a hypothesized direct effect between two latent indicators. Absence of an arrow between indicators represents no hypothesized direct effect.
The SES latent construct had two measured indicators and the home nutritional characteristic latent construct had three measured indicators. Parental education level and parental annual income were indicators of SES while amount of days per week dinner was eaten as a family, fruit and vegetable consumption, and fast food consumption were indicators of home nutritional characteristics. It was hypothesized that SES would predict home nutritional characteristics. It was also hypothesized that home nutritional characteristics would predict BMI in children.
Model Estimation

Weak support was found for the hypothesized model $\chi^2 (8, N = 353) = 27.80, p < .05$, comparative fit index (CFI) = .88, root mean-square error of approximation (RMSEA) = .084. According to Tabachnick and Fidell (2007) the CFI should be larger (i.e., between .92 and .95) and the RMSEA should be less than .06 to support a model.

Based on the Lagrange multiplier test, post hoc model modifications were performed in an effort to develop a better fitting model. Specifically, a direct path was added between SES and BMI.

The final model fit the data more appropriately, $\chi^2 (7, N = 353) = 4.31, p < .05$, CFI = 1.00, RMSEA = .00. The final model with standardized and unstandardized coefficients is presented in Figure 2.

Measurement Model

The standardized coefficients are represented by numbers in parentheses on the paths (i.e., single-headed arrow). Parental Education level (standardized coefficient = .61) and parental annual income (standardized coefficient = .81) were strong measured indicators of the latent construct SES. Time eating together (standardized coefficient = .49), fruit, and vegetable consumption (standardized coefficient = .29),
Figure 2. Revised Model: Socio-Economic Status Predicts Home Nutritional Characteristics and Home Nutritional Characteristics Predict Body Mass Index in Children. Socio-Economic Status also Predicts Body Mass Index in Children.

and fast food consumption (standardized coefficient = -.56) were weaker measured indicators of the latent construct home nutritional characteristics. Specifically, the path between fruit and vegetable consumption and home nutritional characteristics was significantly smaller (standardized coefficient = .29) than the other two measured indicators for home.
nutritional characteristics. Strong measured indicators would have standardized coefficients at or above .60.

**Direct Effects**

Although moderate in effect size and near statistical significance, the latent construct home nutritional characteristics was not predicted by SES (standardized coefficient = -.22, ns). Given the small direct effect size, children's BMI scores were not predicted by home nutritional characteristics (standardized coefficient = -.134, ns). Although near significance, hypothesis one was not supported. Hypothesis two also was not supported.

Results of the post hoc model modification indicated that the added direct effect was significant. BMI scores were predicted by SES (standardized coefficient = -.33, \( p < 0.05 \)).

**Indirect Effect**

Children's BMI was not indirectly predicted by SES through home nutritional characteristics (standardized coefficient = .029, ns).

Almost 11% (i.e., 10.6%) of the variance in children's BMI was accounted for by home nutritional characteristics and SES. Furthermore, a small to moderate
amount (i.e., 4.6%) of the variance in home nutritional characteristics was accounted for by SES.

Supplemental Analyses

Additional analyses were run to investigate any correlational differences in BMI among age groups. Specifically, the data was broken up into the following three groups based on reported age: preschool (i.e., ages 2-5), school age (i.e., ages 6-10), and adolescent (i.e., ages 11-17). Body mass index means and standard deviations for each age group are listed in Table 2.

Table 2. Means and Standard Deviations of Body Mass Index by Age Groups

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Body Mass Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Preschool</td>
<td>18.41</td>
</tr>
<tr>
<td>School age</td>
<td>19.28</td>
</tr>
<tr>
<td>Adolescent</td>
<td>22.26</td>
</tr>
</tbody>
</table>

Separate SEM models were not generated for each age group as the sample size within each group would not allow for powerful SEM analyses (preschool N = 66; school age N = 100; adolescent N = 187). Bivariate correlations were run using all variables (i.e., parent income, education,
fruit and vegetable consumption, fast food consumption, and dinners eaten with family per week) on BMI scores. The results of the additional analyses are presented in Table 3. For the school age and adolescent youth, moderate and significant correlations were found between parent education and parent income on children’s BMI.

Table 3. Correlational Changes By Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Parent Education</th>
<th>Parent Income</th>
<th>Fruit/Vegetable Consumption</th>
<th>Fast Food Consumption</th>
<th>Dinners Eaten with Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>-.060</td>
<td>-.121</td>
<td>.100</td>
<td>.026</td>
<td>-.037</td>
</tr>
<tr>
<td>School age</td>
<td>-.201*</td>
<td>-.246*</td>
<td>.021</td>
<td>.079</td>
<td>.045</td>
</tr>
<tr>
<td>Adolescent</td>
<td>-.217*</td>
<td>-.327*</td>
<td>-.033</td>
<td>-.113</td>
<td>.055</td>
</tr>
</tbody>
</table>

Note. * Correlation is significant at the 0.05 level (2-tailed).
The purpose of the current thesis was to research the relationship between children’s SES, home characteristics, and rates of childhood obesity. Two hypotheses were proposed.

First, it was hypothesized that the condition of children’s SES environments would be positively correlated with their home nutritional characteristics that consisted of time spent eating dinner as a family, fruit and vegetable consumption, and fast food consumption. Although not statistically supported, this hypothesis had a large direct effect. Meaning, SES environments somewhat predicted home nutritional characteristics for children.

Second, it was hypothesized that, children’s home nutritional characteristics would be negatively correlated with BMI scores. The direct effect of this hypothesis was small and it was statistically insignificant thus, it was not supported. Home nutritional characteristics did not predict the BMI scores for children.

Post hoc modifications were made based on the Lagrange multiplier test (Tabachnick & Fidell, 2007). Specifically, the results of the Lagrange multiplier test
indicated a direct path between children's socio-economic status and their BMI scores be added to the model. The modified model revealed that socio-economic status significantly predicted the children's BMI scores.

Additional analyses, not directly related to the hypotheses, were run to investigate any correlational differences between three age groups on BMI: preschool (ages 2-5), school age (ages 6-10), and adolescent (ages 11-17). The results indicated that the three groups were systematically different from each other in magnitude.

Further research using data that would allow the investigation of the distinctions between these three age groups (i.e., preschool, school age, and adolescent) individually would help us to understand and explain the differences in magnitude that were found within the current population. This can be accomplished by increasing the sample size of each age group to run the more nuanced SEM analyses.

The mean BMI scores for the preschool aged group was 18.41, school aged group was 19.28, and the mean adolescent BMI score was 22.26. Based on the CDC guidelines, the mean BMI scores for each age group suggest that the preschool-aged children in the current study may have percentile rankings that range from overweight to
obese. The school-aged and adolescent youth's percentile rankings may range from being classified as having a healthy weight to being obese (Lee, 2007). The percentile ranking will range within each age group based on a child's age and sex. Research has supported the theory that the examined home nutritional characteristics may predict BMI scores for preschoolers (McCaffrey et al., 2006), school-aged children (Galvez et al., 2009; Rollins, Belue, & Frances, 2010), and adolescents (Fulkerson et al., 2009). Further research can investigate potential age group differences that exist within the microsystem.

Application to Ecological Theory

The current study used ecological theory to investigate the relationship between childhood obesity, family SES, and home nutritional characteristics. Ecological theory suggests that change and development is the result of people interacting with their environment (i.e., the relationship is reciprocal; Bronfenbrenner, 1979). The current study examined how the microsystem, mesosystem, and exosystem, contributed to childhood obesity.

The microsystem was represented by two home nutritional characteristic variables (i.e., days per week
families ate dinner together and fruit and vegetable consumption). Previous research found that family meal frequency is a contributing factor to childhood obesity (Ayala, 2010; McCaffrey et al., 2006; Savage, Fisher, & Birch, 2007). Contrary to findings of past research, weak support was found for the role of family meal frequency (i.e., days per week families ate dinner together) as a contributing factor to childhood obesity. The types of interactions that occur during family meal times could be an avenue for research to explore.

Lytle et al., (2010) reported that the types of interactions (i.e., positive or negative interactions) that occur during meal times can put children at risk for becoming overweight or obese. In a separate study, Rollins, Belue, & Frances, (2010) suggested an increase of family meal frequency for minority children put them at risk for becoming overweight and obese. Research is needed to expand on the findings by investigating the types of interactions that take place during family meals and how they affect minority children from non-minority children.

The second variable that represented the microsystem was fruit and vegetable consumption. Adequate fruit and vegetable consumption is an important part of a well-balanced diet for children and adults (Dennison,
Rockwell, & Baker, 1998). Previous research showed that children and adolescents who do not eat the recommended amount of fruits and vegetables a day are more likely to weigh more than those who eat the recommended amount of fruits and vegetables a day (Bisset, Gauvin, Potvin, & Paradis, 2007; Garipagaoglu et al., 2008). Although the reviewed research indicated the significance of adequate fruit and vegetable consumption, the results of the present study showed little support for fruit and vegetable consumption being a contributing factor to childhood obesity. A possible explanation could be that parents were asked if their child ate enough fruits and vegetables a day, not how many servings they ate in a day.

The mesosystem was the next level of the ecological systems theory that was examined. The mesosystem was represented by a third home nutritional characteristics variable -- fast food consumption. Research has shown that children and adolescents who eat fast food consume more calories, added sugars, and fats per day when compared to children and adolescents who do not eat fast food (Bowman et al., 2004; McCaffrey et al., 2006). In contrast to earlier findings, the results of this investigation indicated that fast food consumption was not a predictor of BMI scores for children.
The exosystem was the last level of the ecological systems theory examined. The exosystem was represented by family SES. Socio-economic status is an important factor when examining childhood obesity because the prevalence of obesity is higher for those that live in low SES environments (e.g., families that live below the poverty line; Murasko, 2009; Singh, Kogan, Van Dyck, & Siapush, 2008). The findings were consistent with previous research; SES was a significant predictor of children’s BMI scores.

Results of the present study are not consistent with previous research at the microsystem or mesosystem levels. The measured variables that composed the latent variable home nutritional characteristics (i.e., fast food consumption, fruit and vegetable consumption, and days per week dinner was eaten as a family) did not significantly predict children’s BMI scores.

The findings suggest home nutritional characteristics were not adequately captured in the current study. Specifically, there may have been other characteristics inside and outside of the home that may predict children’s BMI scores. Lazarou and colleagues (2010) report that physical activity could be a mediating factor between BMI and the microsystem. Other mediating factors in the home
that could relate to childhood obesity are sedentary behavior, such as TV watching (Rey-Lopez, Vicente-Rodriquez, Biosca, & Moreno, 2008), and family structure (e.g., single-parent households, family instability, etc.; Schmeer, 2012). A possible mediator outside of the home between BMI and the mesosystem is access to healthy foods. Having access to healthy food outlets (i.e., supermarkets) has been associated with low BMI scores for children while, lack of access to healthy food outlets has been associated with high BMI scores for male and female children (Harrison et al., 2011). Further research is warranted to examine what the key mediators are inside and outside a child’s home that may put them at risk for becoming overweight or obese.

Limitations and Strengths

Limitations in the current study are mainly design-related. Researchers can further explain and expand on the current findings by addressing the limitations in future research.

The first limitation of the study was that the data was self-reported. The reported components that construct BMI, height and weight, may have been inaccurately reported. Previous research has indicated that not only do
adults underestimate their own weight but they also underestimate the weight of others (Vartanian & Germeroth, 2011). De La and colleagues (2009) reported that parents misrepresent their child's weight 25% of the time. Furthermore, all of the parents in their sample of 576 parent-child pairs who had children at or above the 95th percentile incorrectly reported their child's weight status. Seventy-five percent of the parents with children in the 85th-95th percentile also incorrectly reported their child's weight status (De La et al., 2009). In the present study parents may have inaccurately reported their child's height and weight information, and thus, the BMI scores may not have been valid.

Another limitation, also related to the data being self-reported, pertains to the home nutritional characteristic variable -- fruit and vegetable consumption. When health inequalities are examined researchers should be cautious of self-reported data because, as Dowd & Todd (2011) reported, individuals in different socio-economic groups may have different standards for their health. Dowd and Todd (2011) found that Hispanic and African American participants report being healthier then they are while the more educated participants underrated their health. This may have been
reflected when participants answered the question about fruit and vegetable consumption. Parents were asked to discuss the main reason their child did not eat enough fruits and vegetables. Eating 'enough' fruits and vegetables could vary from household to household. Thus a family that eats three servings of fruits and vegetables a week could report that they eat enough fruits and vegetables even though that is below the recommended five servings per day.

An additional limitation to the current research is related to the type of interview that was conducted. Because the interview was conducted over the phone there was little opportunity to build rapport, increasing the likelihood of measurement errors. Sensitive questions regarding immigration status, health care coverage, behavioral problems, etc. were asked during the course of interview. Without the chance to build rapport interviewees may have felt defensive and/or suspicious and, as a result, either failed to respond to a question or responded to the interviewer in a favorable way (i.e., demonstrated the social desirability bias; Holbrook, Green, & Krosnick, 2003). For example, the interviewee might have said the family eats dinner together seven days a week when they eat dinner together 3 days a week because
they think the correct answer might have reflected badly on them as a parent.

Lastly, ethnicity has been shown to be an important factor when examining childhood obesity; the prevalence of being overweight or obese is higher for minority children (Lee, 2007; Ogden & Carroll, 2010; Taylor et al., 2010). The current study only examined the relationship between SES and obesity. Further research should investigate the relationship between SES, ethnicity, and childhood obesity.

A major strength of this study was that the data represented (i.e., was similar to) the demographics in Eastern Riverside County, CA thus, increasing the external validity. By increasing the external validity of the study the results can be better generalized to the residents of Eastern Riverside County, CA as well as other communities with similar demographics. Research that is high in external validity is an important part of community and policy change as researchers are better able to gauge the needs and concerns of the community.

Future Research Directions

The results of the present study add to the growing body of childhood obesity research. This study brings to
light limitations and strengths further research can build upon.

Future research should focus on objectively measured height and weight as opposed to self-reported height and weight to increase accuracy of BMI scores. To accurately and efficiently measure height and weight researchers could consider collaborating with community pediatricians or local schools (i.e., school nurses), as these are common places that children and health care professionals routinely interact.

Design of future research can also allow for in-person interviews that permit interviewers to build rapport and trust with interviewees. This may reduce the likelihood of social desirability bias (Holbrook, Green, & Krosnick, 2003). A longitudinal design, where community members are measured multiple times over the course of a time period may be a more valid and reliable way to measure home nutritional characteristics. This could allow families to record (e.g., tape/video record, write down, photograph, etc.) what they eat in each meal, how frequent they eat with their family, etc. (Buijzen, Schuurman, & Bomhof, 2008). This could allow researchers to see what other home characteristics contribute to childhood obesity. Although a longitudinal design will have an
increase in drop out rates, the data that is recorded could be a valuable addition to childhood obesity research.

Childhood obesity has been predicted by variables such as fast food consumption (McCaffrey et al., 2006), fruit and vegetable consumption (Garipagaoglu et al., 2008), and days per week spent eating dinner with one's family (Fulkerson et al., 2009; Savage, Fisher, & Birch, 2007). However, collectively these three home nutritional characteristics failed to predict obesity in children in the current study. Further investigation of what the mediator(s) are between SES and childhood obesity is warranted. The types of interactions that occur during family meal times (Rollins, Belue, & Frances, 2010), socio-cultural factors (Kaufman & Karpati, 2007), and food insecurity (Martin & Ferris, 2007) are a few additional home nutritional characteristics that could better explain the relationship between a child's home environment and their risk for becoming overweight and obese.

Childhood obesity is an epidemic that has been increasing throughout the United States since the 1970's (Ogden & Carroll, 2010). Furthermore, it tends to impact minorities and individuals living in lower SES environments more than non-minorities and individuals
living in higher SES environments (Lee, 2007; Ogden & Carroll, 2010; Olson, Bove, & Miller, 2007; Stamatakis, Wardle, & Cole, 2010). Children who grow up overweight or obese are at a higher risk for health problems immediately and longitudinally (e.g., sleep apnea, early-onset type-2 diabetes, hypertension, cardiovascular disease, etc.; Lee, 2007).

In an effort to increase the quality of life for children, it is important to continue the research on childhood obesity. Children tend to interact the most in the microsystem, as it is where they live. Investigating additional home nutritional characteristics is a key component to understanding childhood obesity.

Scientists and policy makers should consider the specific needs of the communities they are working with (e.g., what contributes to childhood obesity in one community may not be a factor in another community). Although the home nutritional characteristics investigated in the current study were not significant predictors of childhood obesity (i.e., BMI scores) in Eastern Riverside County, researchers should continue to investigate what the mediating link between SES and BMI is in this community as well as other communities throughout the nation.
The dissemination of research findings to community members through policy change can be an effective way to reduce the prevalence of childhood obesity. The current study provided additional insight regarding how the microsystem, mesosystem, and exosystem interact. For the investigated population, the microsystem and mesosystem did not predict children’s BMI scores while the exosystem did. Additional research is needed to better understand how the microsystem and mesosystem contribute to the childhood obesity epidemic. By furthering research in the field and applying the findings to communities’ researchers and communities can work towards a decline in the prevalence of childhood obesity.
APPENDIX A

HEALTH ASSESSMENT RESOURCE CENTER

SURVEY QUESTIONS
HARC SURVEY QUESTIONS – CHILD 2010 (FINAL)
[“!”=” IN THIS DOCUMENT MEANS “NOT EQUAL”]

HEALTH CARE COVERAGE FOR CHILD

/ASK ALL/
PRECC22
What is the child's age?

01 TIME IN MONTHS [0 - 24]
02 TIME IN YEARS [1 - 17]
98 DON'T KNOW
99 REFUSED

ASK IF PRECC22 = 01
Ce22a
How old is your child?

\___ AGE IN MONTHS [RANGE 0-24]

ASK IF PRECC22 = 02
CC22B
How old is your child?

\___ AGE IN YEARS [RANGE 1-17]

/ASK IF PRECC22 =98 OR 99/
CC22H. This is an important question because many of the following questions in this study are dependent on the age of your child. In order to better understand the health care needs of children of all ages in Eastern Riverside County, it is important we have the age of your child.

01 CONTINUE [RETURN TO PRECC22]
99 REFUSED [TERMINATE]

/ASK IF ANY RESPONSE IN CC22a or CC22B/
CC22chk
Just to check, you indicated your child is //INSERT REPONSE FROM [CC22A months] or CC22B [years] // old, is that correct?

01 CORRECT AS IS
02 GO BACK to PRECC22

01 CORRECT AS IS
02 GO BACK to PRECC22

CHILD'S GENDER
/AASK ALL/

CC21. What is your child's gender/sex?
01 MALE
02 FEMALE
99 REFUSED

INCOME CATEGORIES
/AASK ALL/

CC23. Is your annual household income before taxes?
09 Less than $50,000 {If “no,” ask 10; if “yes,” ask 08} ($45,000 to less than $50,000)
08 Less than $45,000 {If “no,” code 09; if “yes,” ask 07} ($40,000 to less than $45,000)
07 Less than $40,000 {If “no,” code 08; if “yes,” ask 06} ($35,000 to less than $40,000)
06 Less than $35,000 {If “no,” code 07; if “yes,” ask 05} ($30,000 to less than $35,000)
05 Less than $30,000 {If “no,” code 06; if “yes,” ask 04} ($25,000 to less than $30,000)
04 Less than $25,000 {If “no,” code 05 if “yes,” ask 03} ($20,000 to less than $25,000)
03 Less than $20,000 {If “no,” code 04 if “yes,” ask 02} ($15,000 to less than $20,000)
02 Less than $15,000 {If “no,” code 03 if “yes,” ask 01} ($10,000 to less than $15,000)
01 Less than $10,000 {If “no,” code 02}
10 Less than $55,000 {If “no,” ask 11} ($50,000 to less than $55,000)
11 Less than $60,000 {If “no,” ask 12} ($55,000 to less than $60,000)
12 Less than $65,000 {If “no,” ask 13} ($60,000 to less than $65,000)
13 Less than $70,000 {If “no,” ask 14}
($65,000 to less than $70,000)
14 Less than $75,000 {If “no,” ask 15}
   ($70,000 to less than $75,000)
15 Less than $80,000 {If “no,” ask 16}
   ($75,000 to less than $80,000)
16 Less than $85,000 {If “no,” ask 17}
   ($80,000 to less than $85,000)
17 Less than $90,000 {If “no,” ask 18}
   ($85,000 to less than $90,000)
18 Less than $95,000 {If “no,” ask 19}
   ($90,000 to less than $95,000)
19 Less than $100,000 {If “no,” ask 20}
   ($95,000 to less than $100,000)
20 $100,000 or more

**HEIGHT OF THE CHILD**

ASK ALL

PCD1. How tall is //child name// without shoes?

[INTERVIEWER: ROUND FRACTIONS DOWN]

   01 HEIGHT GIVEN IN FEET
   02 HEIGHT GIVEN IN CENTIMETER

98 Don't Know
99 Refused

ASK IF PCD1=001/
CD1
/RANGE=011-805/

ASK IF PCD1=01/
AH14
ENTER HEIGHT IN FEET

ASK IF PCD1=02/
AH14M
ENTER HEIGHT IN CENTIMETERS

**WEIGHT OF THE CHILD**

ASK ALL

PCD2. How much does your child weigh without shoes?
Nutrition

/Ask if CK2=Any/

CK4. Some people do not eat 5 servings fruits and vegetables in their daily diet, if this is true for your child can you tell me the main reason your child does not eat more fruits and vegetables? (Read if necessary)

01 I believe he/she eats enough now
02 Too expensive
03 Not sure how to tell if the quality is good/not sure how to select
04 Other people in the family don't like them
05 Take too much time to prepare and cook
06 A lot of fruits and vegetables that I'm not sure how to prepare
07 Don't like the taste
08 Not in habit/don't think about it/not used to eating them
09 Don't have them available, lack of access
10 They are messy
11 I am concerned about safety: pesticides, genetically engineered foods
12 Other (specify____________________)
13 My child eats 5 servings of fruit/vegetables per day
98 Don't know/No response
99 Refused

/Ask if CK4=12
CK4OTH _____Enter other/specify

/Ask if CK4=Any/

CK5. In the past 7 days, how many times did he/she eat fast food? Include fast food meals eaten at school or at home, or at fast food restaurants, carryout or drive through.
Interviewer note: If needed say, "Such foods you get at McDonald's, KFC, Panda Express or Taco Bell."

___ Number of times (range 01-21)
88 None
98 Don't know/No response
99 Refused
How many times a week do you sit down together to eat dinner with your family?

01 1-2 TIMES A WEEK
02 3-4 TIMES A WEEK
03 5 TO 6 TIMES A WEEK
04 EVERYDAY

88 NONE
98 DON'T KNOW/NO RESPONSE
99 REFUSED

What is the highest grade or year of school you completed?

01 Never attended school
02 8th grade or less
03 Some high school (Grades 9-11)
04 Grade 12 or GED certificate (High school graduate)
05 Some technical school
06 Technical School graduate
07 Some college
08 College graduate
09 Post graduate or professional degree
98 DON'T KNOW
99 REFUSED

Memorandum of Understanding
The Center for the Promotion of Health Disparities Research and Training
California State University, San Bernardino (CSUSB) and
Health Assessment Resource Center (HARC), Palm Desert, California

Project description: The faculty from the Center for the Promotion of Health Disparities Research and Training at California State University San Bernardino (hereafter referred to as the CSUSB team) will partner with the Health Assessment Resource Center (HARC) of Palm Desert to prepare scientific publications and presentations of the 2007 and 2010 Community Health Monitor survey.

Goal: To analyze HARC data to better understand the prevalence of existing health disparities among residents of Eastern Riverside County, examine possible contributing factors, suggest remedies and disseminate research findings to professional and community groups.

1. Guiding Principles for the Community-University Partnership and Projects

- Project(s) will engage a set of principles that honors the ownership of the Community Health Monitor survey data by HARC;
- Project(s) will engage in an open and transparent process where a collective vision of goals and objectives is shared, and where the roles and expectations of members of the partnership are clearly understood; (CSUSB members refers to the Center Director and Co-Director, Executive Committee, Faculty Fellows and invited authors/co-authors on specific project publications. HARC members refers to the Executive Director and/or appointees for specific projects)
- Project(s) will be a collaborative and equitable partnership where members draw upon individual skill sets to meaningfully and mutually work toward the project’s goal;
- Project(s) will provide opportunities for capacity building through “learning exchanges” where members of the partnership can learn about health disparities issues, research skills, community development, and community needs;
- Project(s) will engage in data analysis interpretation processes that honor the contributions of the survey participants;
- Project(s) will employ dissemination strategies to advance the study of health disparities, enhance education about public health issues, increase benefits to the community, and promote positive social change;
- Project(s) will foster a supportive team environment through critical reflection of our work and group process.
2. Roles and Responsibilities of Project Members

Activities will be accomplished in accordance with this Memorandum of Understanding, agreed upon by the CSUSB team members and the HARC administration and staff members prior to the start of the data analyses and preparation of manuscripts for publication and dissemination.

Under the leadership of the Director and Co-Director of the Center for the Promotion of Health Disparities Research and Training, the CSUSB team will:

1. Obtain Institutional Review Board (IRB) approval and complete the “Collaborative Institutional Training Initiative” (CITI) course in the Protection of Human Research Subjects.
2. Provide notarized statements from all members of the CSUSB team guaranteeing the confidentiality of the study participants in the Community Health Monitor survey.
3. Keep survey data in secure and password protected electronic files with access restricted to Center faculty and post-doctoral fellows.
4. In consultation with HARC’s Executive Director, or appointee develop research questions, analyze the survey data, and prepare manuscripts for dissemination through publications and conference presentations.
5. In consultation with HARC’s Executive Director, offer shared authorship on the resulting publications and presentations with HARC staff members most directly associated with the design, data collection, data preparation, and survey reports (as determined by the HARC Executive Director).
6. In all presentations and publications provide acknowledgement to HARC for designing and completing the study.
7. Indicate in all publications and/or presentations that any mistakes in the analyses, presentation of information, or content of the publications/presentations are the sole responsibility of the CSUSB team and not the HARC organization.
8. Participate in all relevant trainings required by HARC.
9. Model professional and appropriate behavior when working with HARC staff, and when present on the HARC site.

HARC will:

1. Provide the de-identified data from the 2007 and 2010 Community Health Monitor survey. The 2010 data will be made available to the CSUSB team once the results have been released to the public.
2. Reserve the right to review and/or veto (in a timely manner) the CSUSB team’s research questions and the publication or presentation of Community Health Monitor survey information.
3. HARC will provide the Methodology Report prepared by MACRO, Int. for the 2007 and 2010 data collection.
3. Decision Making Process

- Any decisions to be made regarding the partnership will include the Executive Committee of the Center for the Promotion of Health Disparities Research and Training and the HARC Executive Director. This includes decisions regarding the dissemination of data as well as submissions for publications.

4. Access to/Dissemination of Data

Based upon the project’s guiding principles, HARC maintains ownership of the research data. Usage of the data will be in accordance with the project goals and will adhere to all requirements of the CSUSB IRB and HARC organization.

In accordance with Community-Based Research principles, the CSUSB team and HARC staff members will implement a model of dissemination that encourages the active involvement of all CSUSB and HARC staff members while taking into account their varying responsibilities and capacities. Research findings will be disseminated in various ways including, but not limited to, journal articles, books, community forums, and conference and classroom presentations.

The research team at CSUSB, in consultation with the HARC Executive Director, will take the initiative in identifying potential journals for publications. Articles may be written by individuals or by writing groups formed to develop particular manuscripts. Order of authorship and mechanisms for feedback on manuscript drafts will be decided up front by writing group members. The order of authorship can change by the time manuscripts are completed to reflect amount of effort and time actually contributed by each author. Groups may also be formed for the development of conference presentations, community forums, and other dissemination activities. The HARC Executive Director, or her designated staff member, reserves the right to review and approve the content of all dissemination activities prior to dissemination.
November 05, 2010

Office of Academic Research • Institutional Review Board

CSUSB
INSTITUTIONAL
REVIEW BOARD
Administrative Review
IRB# 10028
Status
APPROVED

Dear Prof. Land and Prof. Carrere:

Your application to use human subjects, titled, "Health Disparities among Eastern Riverside County Residents" has been reviewed and approved by the Chair of the Institutional Review Board (IRB) of California State University, San Bernardino and concurs that your application meets the requirements for exemption from IRB review Federal requirements under 45 CFR 46. As the researcher under the exempt category you do not have to follow the requirements under 45 CFR 46 which requires annual renewal and documentation of written informed consent which are not required for the exempt review category. However, exempt status still requires you to obtain consent from participants before conducting your research.

The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.

Although exempt from federal regulatory requirements under 45 CFR 46, the CSUSB Federal Wide Assurance does commit all research conducted by members of CSUSB to adhere to the Belmont Commission’s ethical principles of respect, beneficence and justice. You must, therefore, still assure that a process of informed consent takes place, that the benefits of doing the research outweigh the risks, that risks are minimized, and that the burden, risks, and benefits of your research have been justly distributed.

You are required to do the following:

1) Protocol Change: Protocol changes must be submitted to the IRB for approval (no matter how minor) before implementing in your prospectus/protocol. Protocol Change Form is on the IRB website.
2) If any adverse events/serious adverse/unanticipated events are experienced by subjects during your research. Form is on the IRB website.
3) And, when your project has ended.

Failure to notify the IRB of the above, emphasizing Items 1 and 2, may result in administrative disciplinary action.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Compliance Coordinator. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at mgillesp@csusb.edu. Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

Sharon Ward, Ph.D., Chair
Institutional Review Board

Nov 5, 2010

cc:

909.537.7588 • fax: 909.537.7028 • http://irb.csusb.edu/
5500 UNIVERSITY PARKWAY, SAN BERNARDINO, CA 92407-2393
REFERENCES


doi:10.2105/AJPH.2007.130575